ABSTRACT

PROFESSIONAL INCOMES AND RETURNS TO HIGHER EDUCATION IN BRAZIL

By

Augustus James Rogers III

Educational planning requires decisions involving allocation of resources at several different levels. These decisions can be guided by at least three different and mutually supporting approaches, one of which is the rate of return on investment method.

The objective is to measure the intensity of market forces for the "products" of higher education to determine the relative rates of return resulting from specialization in various curricula. Rates of return are expressed as percentages of total investment in education in much the same way as a return to non-human capital. Important by-products are also obtained including approximation of expected lifetime earnings for university graduates; the relationship between income differences and twelve classes of variables such as religion, race, environment, and family composition; and comparative cost data for several university curricula.

The arrays of rates of return are a first approximation in estimating "returns" to society from investing in various

kinds of education and provide starting points for determining educational resource allocation. Further, they suggest policy decisions required to reach those goals of the society concerned with human capital formation.

Data are obtained from the 1960 Brazilian census sample containing twenty-five percent of all households enumerated. Persons who had completed secondary school training or any higher educational level are included in the sample.

Calculations of lifetime income flows are made for the graduates of the several curricula. Taking into account the costs of education, net income flows are converted into rates of return on educational investment. These are then compared between states and professions.

The results indicate that aggregate investment in university education by society is yielding a social rate of return comparable to that received from non-human capital investment. Private rates of return, however, are considerably higher and hence, substantial divergences exist between social and private rates. If these divergences are not the result of social benefits external to the markets studied, then university graduates are receiving an unreimbursed subsidy from society as a whole. Such rate differentials can also be expected to produce a private demand for university education greater than that which is optimal from society's viewpoint.

Both private and social returns vary considerably between the curricula studied. Law and Economic Sciences produce significantly larger social and private returns than those received from non-human capital investment. In addition, small divergences plus inexpensive costs per student in these curricula suggest additional investment might be in order.

Medicine and Engineering show high divergences between social and private rates of return. These divergences plus comparatively high costs per student indicate a need to examine the efficiency with which current levels of investment are being utilized. The possible existence of external social benefits should also be investigated.

Returns to graduates of certain curricula such as Philosophy are so low as to suggest the need of government intervention to raise salaries if current levels of these graduates is to be maintained or increased.

PROFESSIONAL INCOMES AND RATES OF RETURN TO HIGHER EDUCATION IN BRAZIL

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By

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To my patient wife and children

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CHAPTER 1

INTRODUCTION

Educational Planning Tools

Formal education is becoming the subject of increased conscious planning throughout the world. Such planning must include more or less explicit decisions concerning several types of resource allocation. One involves the portion of national product that is to be devoted to education in general. A second concerns allocation between various levels of training such as primary, secondary, and university. A third deals with allocation between curricula within universities such as law, medicine, agronomy, etc., and at the secondary level a choice between academic and vocational training.

Several techniques can be used in this planning process among which are the following:

1. Manpower requirements can be estimated and from them necessary educational facilities may be deduced.
2. A percentage of national product can be set aside for educational use based on goals set by national planners. These goals and percentages can be estimated by reference to the experience of other

countries or by other criteria including simple political expediency.

3. Estimates of present and historical returns from educational investment in terms of individual incomes and/or "social income" can be made. These estimates, deducting educational costs, are used to measure the market's evaluation of educational levels and fields of specialization.

Each of these techniques has its advantages and drawbacks, widely discussed in the economics and education literature of the past decade. The major points are summarized below.

The Manpower Approach.--This technique involves the estimation of future requirements for skilled manpower. Given the goals for productive activities in the economy, the manpower planner estimates both the quantity and composition of labor skills necessary to fulfill production targets. Calculations of necessary changes in existing stocks of skills are then prepared using estimates of mortality, attrition through withdrawal from the labor force, emigration, etc. These net changes are translated into required changes in the educational facilities to attain the manpower estimates.[1]

The use of the Manpower Approach has several advantages. If a society is to "plan" its educational structure,

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[1]For a summary of the general techniques involved, see Herbert S. Parnes, "Assessing the Educational Needs of a Nation" in Educational Planning, ed. Don Adams (Syracuse: Syracuse University Press, 1964), pp. 47-66.

that is, if direct intervention in the economic processes that develop educational facilities is desired, some estimate of future output goals must be made. Unlike many alternative investments (although certainly not all), many decades may be necessary to recoup educational investment as well as the resultant increased productivity. It can be argued that current markets do not adequately reflect these long range benefits and that estimates of future skill requirements that explicitly consider the gestation periods provide an improved basis for current investment. The approach also has the advantage that, given its assumptions, it uses quantifiable variables in equating skills and numbers of qualified people. It is these assumptions, however, that the critics of the Manpower Approach attack.[2]

It is assumed that the quantity and composition of future requirements can be determined. To do this, either technology must be assumed to be constant in the future or a specifically changing technology postulated. Changes that have occurred in the last two decades provide evidence of the difficulties involved in estimating such changes and the folly of maintaining the fixed technology assumption.

A second assumption, usually implicit, involves price and technical substitution elasticities between skills as well as non-labor factors of production. Assuming future technology is known, the determination of a unique

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[2]See, for example, C. Arnold Anderson and Mary Jean Bowman, "Theoretical Considerations in Educational Planning," ibid., pp. 1-46.

requirement for a factor or skill must involve knowledge of relative factor prices or the assumption of fixed factor proportions. Figure 1 illustrates a simplified two factor example. The fixed factor proportions of the production function shown in Figure 1a require a unique set of inputs

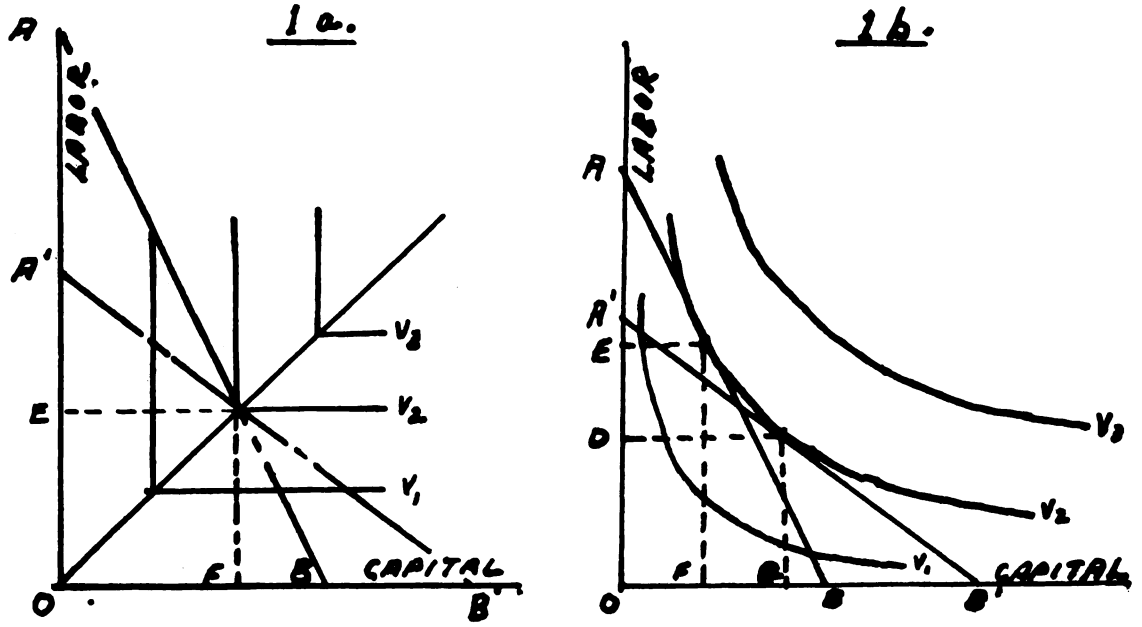


Figure 1.--Fixed and Variable Factor Production Functions

once desired output has been determined--for output isoquant V_2, OE of labor and OF of capital. Absolute factor prices do affect output, but since the relative marginal physical products of the two inputs are indeterminate, relative factor prices do not influence the proportions of factors used. The production function in Figure 1b allows for technical substitution between factors. The determination of output no longer fixes the quantity and composition of the inputs. Output V_2 can be achieved with OE of labor and OF of capital or with OD of labor and OG of capital. Relative

factor prices as represented by the slope of lines AB and A'B' will be equated with relative marginal physical products (the slope of isoquant V_2) at the point of tangency. In this case, it is essential to estimate future factor market conditions as well as output and technology to determine input requirements. The same reasoning is applicable when considering substitution between skills. The lack of substitutability between doctors and engineers is sometimes cited as an example of near zero elasticity of technical substitution between professionals. While this example is clear, it is less obvious that similar inelasticities exist between such groups as lawyers and business administrators or between mechanical and civil engineers in certain applications. Countries with a relatively low level of economic development such as Brazil provide excellent examples of technical skill substitution by the multiple (and often varied) job holdings of its university graduates.

Another criticism of the Manpower Approach is its neglect of benefits from education beyond the development of productive skills. At the university level, many professional curricula include courses not directly concerned with the major field of interest but which nevertheless contribute to the future "quality of life" of the student. For example, an engineering student may take elective courses having little to do with his future competence as an engineer. These courses can, however, contribute knowledge of the culture in which he lives, which cannot only increase

his future "happiness" but also benefit society through increased ability to participate in affairs of the community beyond the scope of his professional skills. Similarly, the education of housewives may not lead to the production of goods and services as measured by national accounts, but it can have an impact on society in various ways such as increased education of children in the home. Another indirect benefit of certain courses may be the development of increased adaptability or flexibility in terms of future employment. For example, mathematics may be studied by an engineering student for later use in his profession as an engineer. The reasoning ability that can also be developed by studying mathematics may also assist this student should he later wish to go into a non-engineering field. This element of flexibility as a part of educational output is discussed further in Chapter IV.

The Manpower Approach usually overlooks the "costs of production" of estimated skill requirements. If the zero elasticity of substitution assumption is correct, the only relevant cost is that of producing the total unique combination of predicted requirements. The size of the output can be varied but not elements within the package. The resource allocation question becomes one of deciding between the educational package and non-educational alternatives. If, however, some substitution is possible, the alternatives expand to include investment patterns between various

curricula within educational levels or between the levels themselves. For example, if it is possible to substitute two semi-skilled workers with a secondary education for one university trained professional, then the decision must be made as to which type of education will be provided. Explicit consideration of alternative costs helps answer questions of this type.

Since future time periods are being considered, the economic growth rate of the country becomes a parameter of major importance. If constant technology and a specific aggregate production function are assumed, input requirements at the end of several decades, with small differences in annual growth rates, would vary considerably. For example, the difference between a three percent growth rate and a four percent growth rate, compounded annually, for twenty years would produce a twenty percent difference in output at the end of the period. Hence, assuming linear homogeneity, there would be a twenty percent difference in required inputs. This problem has particular significance when applying the Manpower Approach to a country such as Brazil. Actual growth rates have been erratic in the past twenty years and the future course of the economy is particularly difficult

to estimate.[3] This is not to say that such estimations should not be made. Different possible growth rates can be postulated for different sets of conditions, by which a range of useful results may be obtained.

In spite of its limitations, the Manpower Approach has a place as one tool for educational planning. When plans developed from its use allow for corrections or "feedbacks" based on actual events, many of the criticisms are reduced in importance. If used to estimate broad categories of educational requirements such as primary, secondary, and university, more useful results are likely than if it is used to estimate specific and highly specialized needs such as numbers of electrical engineers or orthopedic surgeons.

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[3]Annual variation of Gross National Product per capita in 1949 prices has been as follows for the past twenty years:

1947	-	1957	3.8%
1948	8.7%	1958	3.5
1949	2.5	1959	4.2
1950	1.9	1960	3.5
1951	2.0	1961	4.1
1952	2.6	1962	2.2
1953	0.7	1963	-(1.6)
1954	4.7	1964	0.0
1955	3.7	1965	0.8
1956	-(1.1)	1966	1.2

Source: 1947-55 data from Brazil, Instituto Brasileiro de Geografia e Estatística, Anuário Estatístico do Brasil 1961 (Rio de Janeiro: 1961), p. 267.

1956-66 data from Brazil, Instituto Brasileiro de Geografia e Estatística, Anuário Estatístico do Brasil 1967 (Rio de Janeiro: 1967), p. 422.

The Percentage Approach.--This method consists of establishing some percentage of national product to be allocated to education in general and/or to specific sectors within the educational structure. A common criterion for selection of this figure is to look at the experience of some other country. Thus, for example, if the educational output of the U.S. were appealing in quality and composition to Brazil, then Brazil might devote a similar percentage of resources to her educational system. Another version would be to look back to a "comparable" point in U.S. history from the standpoint of current Brazilian development and use the percentage of resources devoted to education by the U.S. at that time as a guide for current action. These "magic numbers"[4] have the appeal of simplicity, but for that same reason, their usefulness is limited. Given historical and current differences between most developed and developing countries, there is no a priori reason to believe that such a comparison has great utility for educational planning.

For example, assume there were a marginal increase in educational investment on the parts of the federal governments of the U.S. and Brazil. Assume further that these increased investments were paid by increasing the personal

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[4]As used by J. S. Chipman in "A Proposal for Extracting a Sample from the 1960 Census for the Purpose of Estimating the Rate of Return to Investment in Education in Brazil," unpublished paper from Brazil, Ministério do Planejamento e Coordenação Econômica, Escritório de Pesquisa Econômica Aplicada(EPEA), (Rio de Janeiro: 1965).

income taxes in both countries using the existing tax systems. The increased tax burden would not be distributed in a similar manner between persons of different income classes in the two countries. The magnitude of this difference is suggested by a report which divided the taxpayers of each country into "high," "middle," and "low" income groups.[5] The high income group in Brazil paid twenty-four percent of the total taxes collected versus fifty percent in the U.S. The low income group in Brazil paid thirty-three percent of the total compared with thirteen percent in the U.S. These distributive effects are ignored by the Percentage Approach as are other differences such as per capita income, educational needs and priorities, etc. Nevertheless, the approach continues to be used particularly by countries in which data for other types of planning are not available.[6] As with the Manpower Approach, these criticisms do not necessarily imply that intercountry comparisons should not be made. They do suggest that the approach must be used with caution and careful attention to the limiting assumptions.

The Rate of Return Approach.--A third tool for educational planning has capital investment theory as its basis.

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[5]Brazil, Comissão de Reforma do Ministério da Fazenda, Estudos de Administração Fiscal (Por Técnicos Americanos) (Rio de Janeiro: Fundação Getúlio Vargas, 1967) p. 73.

[6]Both the Punta del Este Charter and the Declaration of Santiago stipulated four percent of national income as a "desirable" criterion for investment by Latin American countries in their educational systems. (Quoted in Chipman, op. cit.)

Education is viewed as investment in human resource development, the returns from which are calculated and compared with returns from alternative resource use. Before discussing the mechanics of this approach, several frequently used terms need definition.

Social benefit describes any utility to society, whether in material or psychic gains, derived from the investment or expenditure of resources.

Social income describes that portion of social benefits that can be measured monetarily.

Social cost is the market value of resources used or foregone by the economy in producing a good or in making an investment from which future goods will be received.

Social return is the difference between social income and social cost.

The substitution of "private" for "social" above results in terms which are used to describe benefits, incomes, costs, and returns to individuals or groups of individuals within the economy such as "an engineer" or "engineers in Brazil."

The Rate of Return Approach is used to measure social and/or private returns to educational investment. Estimates are made of the earnings attributable to the educational level or specialty being investigated over the working life of the persons concerned. This is normally done by comparing the lifetime earnings of the given group, say, university

graduates, with the lifetime earnings of another group, members of which are comparable in all respect except educational attainment (e.g., secondary graduates with ability equal to the university group as well as background, opportunity for university training, etc.). Subtracting the two income flows produces a return to the additional educational expenditures (investment) made by the individual or society. With the assumption that the market rewards the individual in an amount equal to the value of his service to society, this gross difference in returns will represent the social income attributable to investment in the higher level of education. The comparable private income increment is determined by subtracting from social income any payments made by the individual back to society resulting from higher earnings such as increased income taxes.

Social costs of additional education are estimated by determining the total resources society uses in producing the given proficiency. Included are such direct costs as professors' salaries, physical plant maintenance and depreciation, textbooks, etc. Imputed costs include interest on capital invested in educational facilities and the value of output that could be produced by students were they not attending school. Private costs consist of direct items paid by the student or his family such as tuition, books, and subsistence expenses over and above subsistence costs were the student not in school. The foregone income of the student in alternative employment makes up the imputed component of private costs.

Social returns are calculated by subtracting the incremental social cost of the educational level being studied from the incremental social income to that level. To calculate the social rate of return, incremental social incomes and costs are viewed as flows over the earning lifetime of the individual. The question asked is what interest rate on investment in education would yield the same lifetime earnings as the actual earnings attributable to the educational level being studied. Put another way, if an individual made an alternative non-educational investment at the times and in the amounts equal to that made in the educational investment, he would have to receive an interest rate equal to the calculated rate of return to obtain a comparable lifetime income. After appropriate consideration of differing risks, marketability, and non-market cost/benefits, theory suggests that investment in the production of human capital should continue until marginal increments yield incremental returns comparable to those received from non-human capital investment. In addition to providing information on the "profitability" of investment in human relative to non-human capital, rates of return provide a measure of the relative gains received by investment in different levels of education such as primary, secondary and university, or as in this study, the relative returns to various professions requiring university training.

This method has also been extensively discussed in the literature of the past ten years. The major arguments are discussed below.[7]

The Rate of Return Approach does not attempt to measure the total social benefits resulting from educational investment. Only those benefits reflected in the labor market (estimates of social income as described above) are used in the calculations. Some non-market benefits were discussed earlier when criticizing the Manpower Approach. This deficiency limits the usefulness of both techniques in comprehensive educational planning but does not invalidate their utility as planning tools for that large portion of education which is primarily concerned with the development of productive skills. Specialized university curricula, the major subject of this study, are so oriented.

When social income is estimated from personal income data, the resulting rates of return do not reflect those economic benefits that are external to the immediate labor market. In the case of medicine, for example, the long run benefits of good health in a society might not be totally reflected in the current returns to individual physicians. These benefits might still fit within the concept of social income in that their effect could still be expressed in money terms. The problem, however, is that these effects might not be completely measured by the labor

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[7]Anderson and Bowman, op. cit., pp. 27-30 summarize many of those arguments.

market for doctors. To the extent that such externalities exist, the criticism is valid and social returns will be understated. The direct benefits of education as approximated are juxtaposed with their costs, which is a considerable advantage over the Manpower Approach.

A criticism of the Rate of Return Approach is that it requires an assumption of perfect competition in the labor markets to obtain meaningful results. This is not generally correct; in fact, comparisons between rates of return for different professions and between social and private rates can assist in identifying market imperfections. A restriction of the supply of certain skilled workers would normally raise the wages paid to the holders of the skills and, assuming some elasticity of demand, would reduce the quantity taken.[8] This higher price and lower quantity would not be socially optimal as compared with the results of a ceteris paribus competitive model, but the price (wage) received would still represent society's value of the service in the market. One type of imperfection that could distort social revenue, as expressed by the wages received by labor, is the establishment of a monopsonistic buyer of the workers' services. Assuming the monopsonist did not provide some service at a cost to the consumer less than that which could be

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[8]The imposition of restrictive qualifications for licensing by a professional association is an example.

charged by the individual worker, the price charged society could be larger than labor's wages.[9]

This criticism is clearly unwarranted when discussing the measurement of private returns in imperfect markets. Although the labor income might be higher or lower in the absence of imperfections, rate of return calculations measure returns in the labor markets as they exist. From a planner's standpoint this could be more useful than an idealized competitive optimum.

The objection has been raised that rates of return do not allow for the income effect of ability and family background. At least one study in the U.S. has attempted measurement of the influence of ability.[10] Another study estimates the influence of family background.[11] These studies show that while these two factors do influence income, and hence, rates of return, the effect is minor when

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[9]One can envision a market area with one medical clinic through which all the doctors in the area funneled their services. Even if this clinic were selling its services under perfectly competitive conditions, it could materially affect the labor wages of doctors in its area by varying the quantity hired. Were it a profit maximizer, it would thus generate a "monopsonist profit" and the price paid by the public would be greater than that received in wages by the doctor employees. For this to be the case, however, it must be assumed that the clinic's production function was linearly homogeneous in the relevant range (no returns to scale) and similar to the production functions of the individual doctors in the absence of the clinic.

[10]Gary S. Becker, Human Capital, A Theoretical and Empirical Analysis with Special Reference to Education (New York: National Bureau of Economic Research, 1964), pp. 79-82.

[11]James Morgan and Martin David, "Education and Income," Quarterly Journal of Economics, LXXVII (August 1963).

compared to the influence of educational level received. My study will not attempt to evaluate the influence of ability or family background on rates of return. There is no known research on the intellectual capacity of either students or graduates at the university level that might provide data for such an evaluation. Even granting a high correlation between education received and innate ability, this fact would have little importance to the planner unless the availability of persons with "ability" were a limiting factor in the potential inputs of the country. In Brazil, this seems unlikely in the foreseeable future. The highly selective nature of Brazilian higher education is shown by the comparative "educational pyramids" of Brazil, France and the U.S.[12] For every 1,000 pupils enrolled in the first year of primary school in the respective countries, there were eight students completing a four-year university course in Brazil, ninety in France, and 150 in the United States. The shortage of student capacity in many faculdades has led to a very selective system of entrance examinations for admission into those curricula.[13]

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[12]Américo Barbosa de Oliveira and José Zacarias Sa Carvalho, A Formação de Pessoal de Nivel Superior e o Desenvolvimento Econômico (Rio de Janeiro: Campanha Nacional de Aperfeiçoamento de Pessoal de Nivel Superior, 1964), p. 30. There is little evidence of change in the 1957 data quoted for the higher education level in Brazil.

[13]The Brazilian university faculdade is very roughly the counterpart of an American university "college." Thus, there are faculdades of medicine, law, engineering, etc. that generally operate within a loose university administrative framework.

This situation, plus a secondary preparatory system that is substantially private and expensive to the individual or his family, imposes selectivity not necessarily related to innate ability. Therefore, the absence of ability studies does not seriously impair the validity or usefulness of the results.

Family background will not be considered nor analyzed in this study as there are insufficient data available. This is an unfortunate omission for casual observation indicates that this factor could be an important consideration in analyzing the variance of professional incomes in Brazil and in determining rates of return. There is no question that wealth and position are important factors in obtaining the requisites for university admission. It is less obvious just how much importance they play once a student has graduated from the university. The assumption of "no influence" is restrictive and questionable but unavoidable.

Rate of return studies usually use cross-section data from a given moment in time. This gives a representative result for the aggregate group being studied at the time the data was collected. The age-earning profiles describe income flows of different people at different ages and not necessarily the expected earnings of a given individual for the rest of his working life. Similarly, educational costs based on a current period do not necessarily represent the costs incurred by a member of the group who completed his training twenty years previously. The problems created

by using cross-section data are similar in many respects to those of the Manpower Approach. Both techniques require an estimation of future parameters that are then used to adjust current data. To convert a current aggregate age-earning profile for a group into the expected income flow for a comparable group in the future, an estimate of mortality probabilities must be applied. As data are available for this estimate, my study makes such an adjustment. Other factors can also have a major influence on future income/cost relationships. Changes in the quality of education over time can affect earnings profiles. No attempt will be made to estimate this factor although evidence of its existence will be discussed in connection with certain of the cross-section age-income profiles. Changes in relative costs between educational specialties, as well as changes in costs of educational investment versus non-educational investment, can have an influence on supply and on future returns.

The economic growth rate of the country can affect both future earnings and costs, and technological changes may affect the relative prices of skills through changes in the composition of demand for trained personnel. These effects will not be estimated in this study but should be borne in mind. These factors are likely to have a greater impact on earnings and costs some years from the current period than in the immediate future. For example, a compound economic growth rate has a much greater potential influence on wages forty years from now than ten years

hence. Similarly, the impact of technological change is much less predictable thirty years in the future as compared to five or ten years. Since rates of return use compound interest calculations to relate earnings and costs, the influence of events in the immediate future is many times greater than events occurring toward the end of the period. Some arithmetic examples of this relationship are given in Chapter IV when the sensitivity of the results is discussed.

A further criticism of rates of return is their lack of ability to prescribe quantitative changes in educational investment. At best, the returns only indicate what will happen with small incremental changes in investment.[14] For a single study the criticism is valid. Periodic estimates of rates of return, however, would give comparative results showing ex post reactions to investment changes. These could give substantial clues as to the influence of known quantitative investment changes.

Not all expenditures for schooling can be considered as investments in increased productive capacity. Schultz divides educational expenditures into three categories:[15]

1. Education can be purchased for present consumption. Utility derived per se from studying or from the

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[14]This study actually calculates average returns. With the assumption of perfect competition, they would be marginal as well. If a downward sloping demand curve for the skill exists and there are also imperfections in the market, marginal returns will be lower than average returns.

[15]T. W. Schultz, The Economic Value of Education (New York: Columbia University Press, 1963), pp. 55-58.

social contacts of university life falls into this category.

2. Education can be purchased for future consumption. This can be considered as an investment from which consumption will be gained in the future such as the developed ability to appreciate literature.
3. Education can be procured which will directly increase the future productivity of the individual. This is analytically equivalent to investment in a producer good.

He points out that the relative size of each of these categories is unknown but that, at least in the United States, the last two (both investments) are probably very large when compared with the immediate consumption component. At the present time, there is no clear-cut method for accurately determining the separation of these components. A student may, for example, gain immediate utility from studying Shakespeare (present consumption). This same act may increase his ability to derive future utility from reading literature (investment for future consumption). It is also possible that having this future leisure-time activity available, the individual's subsequent productivity may also be increased (hence, investment for improved future income flows). A further difficulty arises in that consumption for one individual (e.g., the Shakespeare lover) may be investment for future income for another (e.g., a future professor of English literature).

This problem will be minimized in my research by studying primarily graduates of specialized university courses oriented toward the development of professional skills. While curricula such as medicine and engineering may contain a consumption component for some students, it is likely to be small in relation to the investment made for increased future productivity. The study of Law in Brazil may be an exception to highly specialized university training and the possible impact of this exception is discussed in Chapter IV.

The Rate of Return Approach was selected to provide a complementary technique for educational planning. Despite its limitations, the technique can provide some insights into the problems of alternative resource use that the exclusive use of the Manpower Approach does not. The recent availability of the 1960 Census data provided a unique opportunity to begin a study, the value of which should increase as more data become available in future time periods. Others have conducted rate of return studies in other developing countries of the world.[16] These studies have been primarily concerned with rates of return to various educational levels or years of education completed.

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[16]For example, Martin Carnoy, "The Cost and Return to Schooling in Mexico: A Case Study," unpublished Ph.D. dissertation, University of Chicago, 1964, also Carl S. Shoup, et. al. "The Fiscal System of Venezuela," A Report of the Commission to Study the Fiscal System of Venezuela (Baltimore: The Johns Hopkins Press, 1959) and "The Falk Project for Economic Research in Israel; Fifth Report; 1959 and 1960," (Jerusalem: 1961), pp. 138-46 and 146-50, as cited in T. W. Schultz, op. cit., p. 29 and pp. 61-2.

This study is limited to returns to educational investment at the university level and factors related to differences in professional incomes. The following steps are carried out:

1. The income of various categories of university graduates in different areas of Brazil is determined as well as income received by secondary school graduates only.
2. The influence on income of such factors as years of university completed, family composition, sex, race, occupation, and rural/urban environment is analyzed.
3. Income differentials between groups of persons completing various curricula at the university level are studied.
4. Costs of university education by curricula from the standpoint of the individual and society are estimated.
5. The internal rates of return to investment in higher education by individuals and society are calculated.

Background Notes on Brazilian Education

It is useful to describe briefly some background of the contemporary Brazilian educational system.[17] Prior to the nineteenth century, the function of education remained largely within the family. University level training was obtained only by travel abroad. During the nineteenth century, scattered *faculdades*, or schools, began to spring up in the several urban areas of the country. These *faculdades* concentrated on a single curriculum such as medicine, philosophy, or law, and the quality of instruction was generally inferior to that obtainable in Europe or North America. Instruction was performed by professional men (doctors, lawyers, etc.) who accepted the task on a part-time basis for motives of prestige and social advancement as opposed to an income-producing activity. The functions of these courses were ". . . to train practitioners of the liberal professions, especially law and medicine; and to enable sons of high-status families to maintain their status."[18] The late nineteenth and early twentieth centuries saw the development of *faculdades* with technical curricula in the fields of engineering, agriculture and economics.

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[17]The following discussion relies heavily on Robert J. Havighurst and J. Roberto Moreira, *Society and Education in Brazil* (Pittsburgh: University of Pittsburgh Press, 1965), Chapters VII, IX, and X.

[18]*Ibid.*, p. 199.

The "university" is a relatively new development in Brazil. The first was organized in Rio de Janeiro during the early 1920's by combining existing faculdades of medicine, law, and engineering. The primary reason for integrating the independent faculdades into a university framework was to increase educational efficiency. Course duplication, particularly at the lower levels, could be reduced; increased utilization of facilities and personnel could be attained; and more uniform intercurricular quality standards could be established.

Universities developed slowly in the period 1920-40. As late as 1961, only thirty-two out of 1093 institutions of higher learning were recognized as universities by the federal government. In most cases, the formation of a university structure merely added another level of bureaucracy to the system without accomplishing the goals mentioned above.[19] The traditional rights, privileges, and powers of the "chaired professors" (catedráticos) in the separate faculdades are not easily changed nor shared. These persons, once appointed or elected to their posts, are virtually immune to pressures for change and progress. Originally, this autonomy was granted to prevent undue interference on the part of the government in the affairs of academia. While initially justified, the

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[19]This statement does not apply as generally to certain of the private universities such as the Pontifícia Universidade Católica in Rio de Janeiro.

result of the system today is to inhibit meaningful reform in either the structure or content of higher education. In the Spring of 1968, it was still impossible for a basic chemistry course taken by a first-year pharmacy student to be accepted for credit in the medical school of the Federal University of Rio de Janeiro should the pharmacy student transfer into medicine. This was true in spite of the fact that faculty members in both schools agreed that the basic chemistry courses offered by the two schools were essentially the same. Similar examples of duplication in both facilities and personnel can be found in many (if not most) universities today. The tradition of tempo parcial (part time) for faculty members continues to be the rule, with low salaries that discourage university teaching as a profession.[20]

The selective nature of the Brazilian educational system is another element of importance in interpreting and evaluating the results of this study. An educational "pyramid" based on a cross-section of student population in 1962 indicates two points at which major attrition occurs in school attendance. The first of these follows the first year of primary school. For every 10,000 students in the first year of primary, there are only 4,053 enrolled in the

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[20]For example, the following table of salaries applied in October 1966 for faculties of federal universities:

	Cr$/Mo.	U.S.$/Mo.
Full professor (Catedrático)	438,000	$199.00
Associate professor (Adjunto)	409,000	186.00
Assistant Professor (Assistente)	336,000	153.00
Instructor (Instrutor)	307,000	140.00

second year. The second major drop occurs between primary and secondary school where the "per 10,000 first-year students" rate drops from 2,673 in the last year of primary to 952 in the first year of secondary.[21] This occurs for two major reasons. When calculated as a percentage of total enrollment, public ("free") primary schools represent 87.5 percent of the total primary school population (1962 data). Secondary schools are 52.0 percent private and hence require payment of tuition (1965 data).[22] The second reason for the large attrition at this point is the use of an entrance examination to gain admittance to secondary school. For example, only 272,841 students passed the entrance examination for secondary school in 1963 out of 515,116 candidates.[23] This does not mean that all those who failed the entrance examination did not eventually gain admission. The following year they could have tried the examination again, often after attending "cram courses" aimed only at passing the entrance requirement. There are no data available on the number of repeaters included in the candidates.

An additional severe reduction in the student population profile occurs between the secondary and university levels. For every 10,000 students enrolled in the first year of

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[21] Data are taken from Brazil, Ministério do Planejamento e Coordenação Econômica, Escritório de Pesquisa Econômica Aplicada (EPEA), Educação (I): Diagnóstico Preliminar (Rio de Janeiro: Ministério do Planejamento e Coordenação Econômica, 1966), p. 124.

[22] Ibid., p. 69.

[23] Ibid., p. 40.

primary, 188 are enrolled in the final year of secondary and only seventy-six are entered in the first year of higher education courses. The primary rationing device used to accomplish this reduction is the college entrance examination or vestibular. The aggregate number of persons passing all entrance examinations as a percentage of those who took the examinations ranged from 33.4 percent to 46.5 percent in the period of 1954 through 1964. Unfortunately, these aggregate figures mask even more serious reductions in the popular (and profitable) fields of engineering and medicine where passing percentages ranged from 12.4 percent to 20.9 percent for medicine and 16.3 to 34.8 percent for engineering in the same period.[24] Since 1960, even the vestibular has failed to limit qualified candidates sufficiently for certain disciplines in certain universities. For example, in 1964,

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[24]The complete figures for each major curriculum are listed below:

Percentage of Candidates Passing University Entrance Examinations

	1954	1957	1958	1959	1960	1961	1962	1963	1964
Engineering	22.7	19.9	22.7	23.6	19.5	16.3	26.1	30.5	34.8
Medicine	19.8	13.2	16.2	15.9	12.4	14.0	20.9	16.2	19.4
Agronomy	42.5	39.1	36.3	40.3	33.4	39.4	41.9	35.4	47.4
Architecture	27.3	23.8	29.5	27.0	27.7	24.2	28.9	35.5	40.4
Economics	67.0	60.8	61.1	58.5	57.0	49.8	53.0	58.8	61.3
Law	52.7	47.5	46.0	42.5	48.0	47.0	52.1	52.8	57.8
Pharmacy	55.6	55.8	51.7	49.9	51.0	46.2	64.7	71.3	70.4
Philosophy	68.0	61.8	62.2	60.4	58.9	56.8	65.8	71.5	74.3
Dentistry	42.2	47.5	42.1	45.5	42.8	46.9	58.1	58.9	67.3
Total	41.6	36.7	37.5	36.5	35.0	33.4	40.3	41.2	46.5

Source: Ministério do Planejamento e Coordenação Econômica, Escritório de Pesquisa Econômica Aplicada (EPEA), Educação (II): Diagnóstico Preliminar (Rio de Janeiro: Ministério do Planejamento e Coordenação Econômica, 1966).

113,074 candidates took entrance examinations. Of this number, 46,820 passed and hence were qualified to fill the 56,446 vacancies (vagas) available in all Brazilian institutions of higher learning--no apparent problem. Within these figures, however, are the figures for Guanabara (the city of Rio de Janeiro) indicating that 6,919 students from 20,020 candidates passed the examinations to fill 6,192 vacancies.[25] The situation was even worse when viewed from the standpoint of different curricula. Schools of Medicine, for example, had vacancies for 2,805 entering students in 1964. That year, 4,120 students passed the entrance examinations for the study of medicine and were thus historically qualified for admission.[26] All university graduates completing their courses in the period 1956-63 increased from 13,871 in 1956 to 19,687 in 1963. Again, however, the graduates of the more popular curricula of medicine and engineering did not increase to the same degree.[27]

All of the characteristics discussed above tend to limit both inputs and outputs of Brazilian higher education. The differences in the availability of vacancies between the several curricula can be expected to affect markedly the supply of personnel from those curricula, and therefore, the returns to the different professions.

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[25] Ibid., p. 140

[26] Ibid., p. 143

[27] Ibid., p. 169.

CHAPTER II

THEORETICAL EXPECTATIONS AND METHOD OF ANALYSIS

Age-Income Profiles

A large portion of this study is concerned with the lifetime earning patterns of persons completing different levels of formal education (secondary and university) and differences in the age-income profiles of persons completing different curricula at the university level. Economic theory suggests several hypotheses concerning the shapes and levels of these profiles. These can be at least partially tested using the available data. The hypotheses are set forth in this chapter.[1]

Assume that a group of completely untrained persons finds employment in which its marginal product (and by assumption, wages) remains constant throughout the working lifetime of the group. In Figure 2, this is represented by line AB with wage OA and working lifetime OE. Consider this wage (OA) as the alternative wage of any other group of persons which is able to obtain training in some form. In this case it is possible to consider line AB as a base of zero

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[1] The theory presented here draws heavily on Gary S. Becker, Human Capital, A Theoretical and Empirical Analysis with Special Reference to Education (New York: National Bureau of Economic Research, 1964).

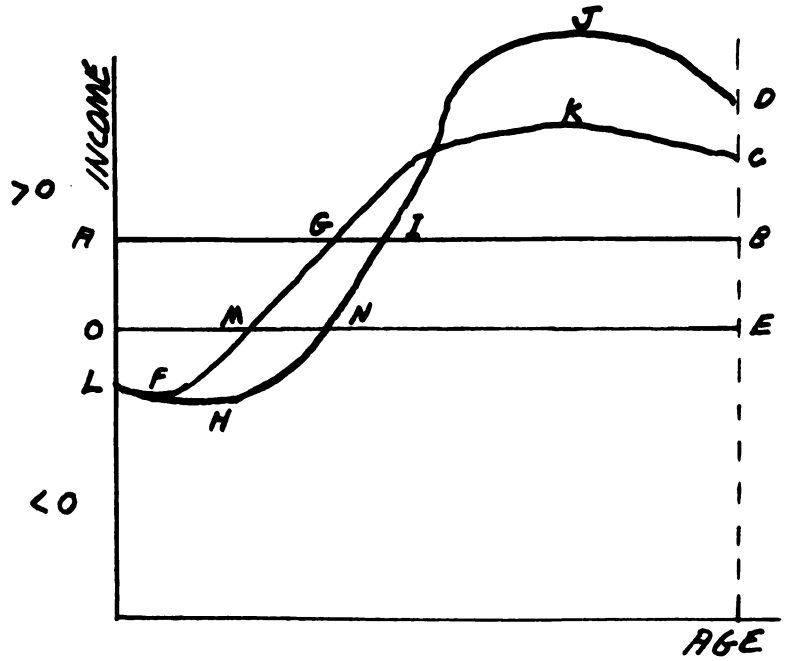


Figure 2.--Age-Income Profiles

difference in alternative income. On a comparative basis, consider another group of persons such as secondary school graduates. If these persons are unable to work during their educational training, they will incur an imputed cost at a rate equal to their alternative wage (OA). In addition, they will generally pay an explicit cost in the form of tuition, books, travel, more expensive subsistence, etc.--in this example, initially equal to OL. Assuming that some portion of their education is increasing their productive capabilities, the foregone income component of educational costs will increase during training to some maximum point (F).[2] On

[2]Discontinuities can exist in this portion of the cost-earnings curve. As an example, a Ph.D. candidate on the day before he completes his dissertation may have an alternative income considerably below that which he has the next day. This difference is not necessarily proportional to the difference

completion of training, wages for the group would be expected to rise above those of the untrained group. The rapidity of this increase will depend on several factors. If a large amount of on-the-job training is involved beyond formal education, the apparent slope of the profile will be decreased. I say "apparent" slope since reported earnings would be net of training costs borne by the individual in obtaining this on-the-job training. As pointed out by Becker, the proportion of total on-the-job training costs paid by the individual vis-à-vis his employer will depend on the degree of "generality" of the training.[3] The more application the skill has to positions outside that of the firm providing the training, the larger will be the portion paid for by the trainee. A second determinant of the profile slope in the period following formal education is the accumulated cost of acquiring the productive skill. One would expect the increase in income to be more rapid in those cases involving high levels of educational investment than would be the case in professions requiring less expensive education.

These points can be illustrated by adding curve LHJD to Figure 2 as the expected profile for a graduate of a higher educational level, such as university. Assuming the university student follows the same secondary preparation in

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in his potential marginal product produced during the intervening night.

[3]Becker, op. cit., Chapter II.

terms of cost, the profiles are coincident through this period of time. Beyond the secondary level, the foregone income portion of costs continues to increase for the university student, thus increasing his "negative income" to point H. From this point, his profile rises more steeply and reaches a higher point (J) than the profile of the secondary graduate--these increased earnings reflecting the returns on additional investment in training. The ages at which the earnings of the several groups begin to decrease are indeterminate due to the interaction of different forces. One would expect an increased level of health to be associated with increased education, hence, a longer working lifetime. On the other hand, higher incomes attributable to increased education may produce increased non-human wealth which could increase the amount of leisure taken in later years as compared to persons of lower income. By the same token, educational differences could produce different termination points in the earning lifetimes of various groups.

Educational Quality

Several problems involved in the use of cross-section data have been mentioned briefly in Chapter 1. One of these that can be expected to have a particularly important influence on the shape and level of age-income profiles is the result of changes in the quality of a given educational curriculum over time. "Educational quality" in this instance refers to aspects of content or instruction of a given curriculum reflected in productivity differentials during the

subsequent working lifetime of the graduate. Only differences measured in money incomes are considered. Thus, educational quality--the quality of the course completed by a student--becomes an argument in descriptive or predictive formulae explaining income variance between graduates with a common educational specialty.

Cross-Sectional Quality.--Quality differences can be separated analytically into two categories--cross-sectional and secular. The former would include differences in the quality of a given curriculum offered by different institutions.[4] The earnings potential of a graduate of medicine from the Federal University of Espírito Santo might be different than that of a graduate of medicine from the Federal University of Rio de Janeiro. This difference in expected lifetime earnings could reflect both quality differences in the curriculum offered as well as differences in the abilities of the respective student inputs. It could also result from differences in the amount of effort expended by students during their university training. Cross-sectional differences of these types are averaged in my study of professional incomes and rates of return. There are no available data relating specific graduates to the institution from which they received their degrees. There are no data on the "ability" or intellectual capacity of

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[4]Ernest Haveman and Patricia Salter West, They Went to College (New York: 1952), p. 178, quoted in Edward F. Renshaw, "Estimating the Returns to Education," Review of Economic Statistics (August 1960), 319.

either students or graduates which might be used to isolate this influence. Cross-section data from the 1960 Brazilian Census have been used to estimate incomes and returns to the "stock" or educational capital embodied in the graduates of the several educational specialties at the university level. Cross-sectional quality differences are not identified and thus become a specification error within the unexplained residual of income variance in regressions on log income. There is no reason to assume that cross-sectional quality differences bias the predictive value of rate of return calculations. If older age groups in the sample under consideration contain a larger portion of graduates from "poor" quality institutions as compared to current graduating classes, predicted future returns will be understated. The converse would be true as well. My assumption of neutral change in the relative cross-sectional quality composition between age groups is necessary due to lack of data relating respondents in the 1960 Census to the institutions from which they graduated.

Secular Changes in Educational Quality.--Changes in educational quality over time are also a major concern. "Quality" in this instance is described by differences in the earnings potential of graduates resulting from changes in the content or caliber of instruction within a given curriculum. Profiles calculated from cross-section age and income data for a specified sample yield the earnings of persons at different points on their individual age-income

profiles. For example, representative earnings of graduates in Agronomy are calculated from the actual earnings of agronomists of different ages. After deducting the "opportunity cost" of alternative employment without the university training, the resultant gross return (now expressed as a "flow") is capitalized at a rate which will equate the return to the capitalized value of the training costs involved. As a measure of returns to the existing stock of capital investment in agronomists, no bias is imparted to the results from secular influences. However, if the rate is used as a predictive device for future rates of return, secular shifts of profiles, both past and future, become important. Cross-section calculations of this type calculate the functional relationship

$$Y = f(A, C_i) \qquad (1)$$

where Y equals lifetime earnings, A equals age, and C_i is an earnings coefficient for the i^{th} course completed. Secular changes in the quality of the given curriculum imply that the argument C_i changes over time or

$$C_i = C_i[q_i(t), \gamma], \qquad (2)$$

a functional (function of a function) which includes changing quality over time in the i^{th} curriculum, $q_i(t)$, and the actual time of graduation, γ, as arguments. Thus formula (1) will not measure a unique age-income profile for graduates of C_i unless

$$\frac{dC_i}{dt} = 0 \qquad (3)$$

and unless other potential secular influences are neutral (technological change, changing relative training costs, etc.). Instead, it will measure the incomes reported at the time of data collection for persons of different ages whose individual age-income profiles will depend on $q_i(t)$ and γ, as shown in Figure 3.

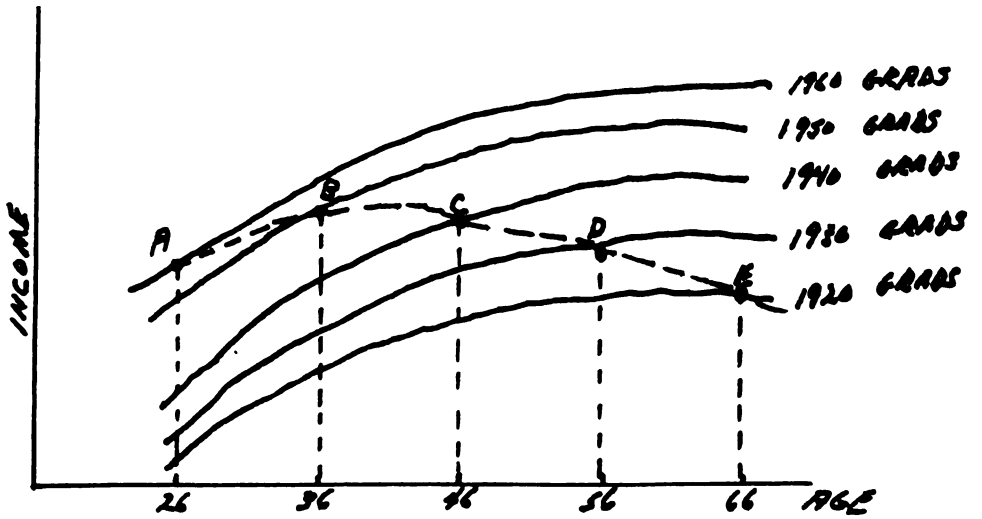


Figure 3.--Changes in Quality of Education

Assuming

$$\frac{dC_i}{dt} > 0 \qquad (4)$$

the expected future earnings of younger graduates will be underestimated by (1).

Measurement Problems.--The problem of estimating the quality change function, $q_i(t)$, for each i^{th} curriculum is twofold. First, the influence of secular quality change must be isolated from other secular influences on incomes. This problem is not unlike that faced by investigators in

estimating statistical demand functions.[5] Cross-section price and quantity data are resultant figures not only reflecting the influence of the arguments of the demand function (price of the given good, prices of related goods, income, and tastes), but also the influence of hypothetically unrelated arguments contained in the supply function for that good. The use of time-series data introduces further complications of price level differentials, secular changes in the arguments of both supply and demand functions, and product identification.

There is an analogy to educational quality changes found in demand estimation. If the demand for Chevrolet automobiles were to be estimated from time-series data, one would obtain price and quantity information for Chevrolets purchased in different years. Assuming all other influences could be statistically removed from the data, the problem would remain that a 1940 Chevrolet is a different product than a 1960 Chevrolet. The importance of this secular quality difference would depend on the comparable quality changes that had taken place in the production of competing products such as Ford or Plymouth automobiles. If the relative change in quality had been small, the comparative demand functions would be less affected than would be the case if

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[5]The following discussion is based on Henry Schultz, The Theory and Measurement of Demand (Chicago: University of Chicago Press, 1938); Lawrence R. Klein, An Introduction to Econometrics (Englewood Cliffs, N.J.: Prentice-Hall, 1962); and Milton Friedman, Price Theory, A Provisional Text (2d ed. rev.; Chicago: Aldine Publishing Co., 1966).

quality differentials had become large. If the calculated demand function were to be used to predict future sales, and the relative quality of Chevrolets had increased substantially during the latter portion of the data period; estimates of future demand would be understated.

If data can be obtained, the several influences can be separated using multiple regression techniques. In the case of demand, for example, changes in income can be included along with price as an independent variable and a regression coefficient calculated estimating its independent relationship to quantity demanded. If income and product price are themselves related, the problem becomes more difficult but still capable of solution with more sophisticated statistical techniques. If observations of price and quantity can be found that are consistent with different (and known) conditions of supply, the shifting supply function will describe points along the price-quantity demand function. Finally, some arguments in the demand function, such as tastes, are not directly measurable. In this case, it is necessary to find a measurable proxy which will describe the market influence of the actual variables.

The influence on income of $C_i[q_i(t), \gamma]$ is included in total income variance and its identification and quantification could be accomplished in two general ways. If all major secular influences on income change such as demand changes for skills brought about by technological change, changing relative costs of acquiring different types of

human and non-human capital, and changes in the cost of preparatory training could be identified and measured; then residual variance could be said to be primarily the result of the quality factor. In this case, $q_i(t)$ and the value of the functional $C_i[q_i(t), \lambda]$ would descriptively "fit" historical data. This would assume, however, that the function $q_i(t)$ had not changed.

An alternative method would be to determine the major arguments of the generalized $q_i(t)$ function. This function merely indicates that the quality of the i^{th} curriculum does change over time. If the causes of that change could be determined one might develop a formulation that would allow predictive estimates of the way $q_i(t)$ changes. For example, assume that wage rates in the profession(s) requiring completion of the i^{th} curriculum were positively correlated to an increase in quality within the curriculum on a lagged basis.

$$\frac{q_i^{\lambda}(t)}{w_i^{\lambda-1}} > 0$$

In this instance, estimation of the value of this first partial derivative would permit the use of current estimates of income to predict a portion of the component of future income attributable to quality change. The circular influence of

$$w_i^{\lambda-1} \Longrightarrow q_i^{\lambda}(t) \Longrightarrow w_i^{\lambda+1}$$

would cause difficult but not insurmountable statistical problems.

Three types of data could be used in estimating age-income profiles--time-series, comparative cross-section, and cross-section. With time-series data, it would be possible to trace the earnings of either separate individuals or graduates of a given curriculum at a given time over their working lifetime. From these data, profiles and shifting profiles could be determined. If the characteristics of the courses completed by students in each time period could be determined, proxies for educational quality might be established. For example, increases in the average number of physical and natural science courses required for agronomists might yield a partial proxy. This might be combined with decreasing student/teacher ratios, increased plant investment per student, and increased length of required course.

Corrections for other secular influences would have to be made. One of the most difficult would be monetary corrections. With high rates of general inflation combined with substantial rate differences between sectors, the choice of appropriate index bases is difficult. Secular changes in all of the arguments of the labor market supply and demand functions would have to be estimated and isolated as described above.

Comparative cross-section data would probably not give continuous time-change information obtainable from time-series. Nevertheless, the same approaches could be utilized.

Cross-section data give observations from only one point in time. While the potential measurability of secular change is limited, it is not eliminated. Were it possible to

identify graduates of different time periods with the content of the courses they completed, some evidence of potential quality change might be gathered. From a single observation of age and income, it is impossible to construct separate profiles for graduates of different time periods. However, if data were available from which proxies of quality could be constructed, income variance versus changing proxies might produce some meaningful hypotheses.

Educational Quality in Other Studies.--The problem discussed here has been recognized by other researchers in the field of human capital measurement. A review of their work with respect to educational quality follows.

Becker discusses cross-sectional quality and suggests that such differences may be reflected in different educational costs, thus tending to leave the rate of return relatively unaffected.[6] He does not specifically consider secular quality changes.

Theodore Schultz does not refer to quality changes in either his "Investment in Human Capital" or "Capital Formation by Education."[7] In his later book, he refers only to changes in the quality of educational inputs as affecting

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[6] op. cit., p. 158.

[7] Theodore W. Schultz, "Investment in Human Capital," American Economic Review, LI (March 1961); and "Capital Formation by Education," Journal of Political Economy, LXIX (December 1960).

costs and adds that good data to estimate this parameter are not available.[8]

Martin Carnoy's study of returns to education in Mexico uses a method of analysis similar to the one I have employed. He acknowledges the probable existence of cross-sectional quality differences and notes that some of the variables he uses may include these differences.

> "At the same time, father's occupation, industry, city, and attendance [variables] may explain income differences which are due to quality of schooling differences."[9]

Later in the study, he notes the problem of secular quality changes.

> "In addition, quality of schooling changes over time probably bias the slopes of these [age-income] profiles downward at all schooling levels. With existing data it is not possible to correct for any such changes over time; this study has to be satisfied with current income differences in estimating the return to schooling."[10]

Burton Weisbrod uses cross-section data to estimate the discounted present values of various lifetime income flows. On the general problems of using cross-section data he says,

> "It should be noted that the use of cross-section data for earnings, survival probabilities, and other variables in our calculations leaves any changes in their age-specific values over time unconsidered. As a result, our computations are of human-capital values under static age-specific conditions. Of course, one can make predictions of temporal changes

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[8]Theodore W. Schultz, The Economic Value of Education (New York: Columbia University Press, 1963), p. 35.

[9]Martin Carnoy, "The Cost and Return to Schooling in Mexico: A Case Study" (Unpublished Ph.D. dissertation, University of Chicago, 1964), p. 37.

[10]Ibid., p. 61

> in these variables if he wishes. Since such temporal changes are likely to be in the direction of increasing the capital value of a man at most ages (rising earnings, falling mortality rates), the estimates of human-capital values presented here will tend to be on the low side."[11]

Edward Renshaw's survey article of several attempts to estimate human capital mentions problems of using cross-section data to estimate lifetime incomes, but secular change in educational quality is not among the limitations discussed. He does specifically note the cross-section quality component in his citation of the Havemann and West study cited above.[12]

Campbell and Siegel attempt demand estimates for higher education in the United States and point out the different demand that exists for "lower quality" higher education such as junior colleges and other two-year institutions. They use time-series data in deriving their functions and do not mention secular quality change as an argument.[13]

Swift and Weisbrod study additional returns to educational investment accruing to a given generation based on the investment in education made by the previous generation. They use cross-section data and do not specifically mention secular quality changes. They do say, however,

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[11] Burton A. Weisbrod, "The Valuation of Human Capital," Journal of Political Economy, LXIX (October 1961), 428.

[12] Edward F. Renshaw, "Estimating the Returns to Education," Review of Economic Statistics (August 1960), 319.

[13] Robert Campbell and Barry N. Siegel, "The Demand for Higher Education in the United States," American Economic Review, LVII (June 1967), 491-2.

> "We have assumed implicitly no change over time in the level or structure of education-income relationships. If the growing demand for well-educated labor increases the earnings differentials between persons at different educational levels (or growing supply decreases them), our estimates of intergeneration returns to education will tend to have a downward bias.[14]

The Williams College study of educational productivity in Chile discusses the implications of cross-sectional quality on earnings profiles.[15] At another point, the study acknowledges the potential existence of secular quality change and suggests that evidence such as changing student/teacher ratios, availability of teaching materials, and educational levels of faculties might be used as proxies for secular quality change. It then states that since this information is not available, quality change must be ignored.[16]

Hansen's study of rates of return to educational investment makes no explicit mention of the secular quality change problem. Since he uses cross-section data, he makes the following qualification of the study.

> "Fifth, all estimates rest on cross-section cost-income relationships and thereby ignore future shifts in the relationships of the cost-income streams. And finally, any number of other factors

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[14]William J. Swift and Burton A. Weisbrod, "On the Monetary Value of Education's Intergeneration Effects," Journal of Political Economy, LXLII (December 1965), 648.

[15]The Productivity of Education in Chile (Williamstown Mass.: Williams College, Center for Development Economics, Research Memorandum No. 12, 1967), p. 6

[16]Ibid., p. 19.

may impinge on the observed income differentials, in the form of education at home, on-the-job training, and so forth.

"While some would suggest that the presence of such problems seriously limits any conclusions concerning empirical relationships between income and schooling, it nevertheless seems worthwhile to set forth the rate of return estimates in their crude form. From them some preliminary conclusions about resource allocation can be drawn."[17]

The Morgan-David study of education and income also uses cross-section data. In qualifying their earnings data they state,

"The measure of education is years completed, without any indication of quality."[18]

Later, in qualifying their results, they say,

"Thirdly, the quality of education differs between schools, and over time. Had our measure of education been a more precise measure of the quality of education absorbed rather than years completed, the estimated effects would almost certainly have been larger. People of different ages received different kinds of education. Whether the differences between levels now represent greater differences in real education or smaller differences than a generation ago is difficult to say."[19]

Houthaker's study of education and income uses cross-section data from the 1950 U.S. Census. He does not explicitly mention the quality problem.[20]

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[17] W. Lee Hansen, "Total and Private Rates of Return to Investment in Schooling," Journal of Political Economy, LXXI (April 1963), 133.

[18] James Morgan and Martin David, "Education and Income," Quarterly Journal of Economics, LXXCII (August 1963), 424.

[19] Ibid., p. 436.

[20] H. S. Houthaker, "Education and Income," Review of Economic Studies, XLI (February 1959).

Blaug's study of rates of return to education in Great Britain makes note of the secular problems caused by using cross-section data. One of the six major objections noted is that

> ". . .(3) the calculations depend on the projection of future trends from cross-section evidence, thus neglecting historical improvements in the quality of education as well as the effect of secular growth of education on prospective earnings differentials; . . ."[21]

Later in the same article, he presents a summary of the problem quoted below.

> "Thus it seems that cross-section data do not necessarily yield irrelevant results. But this conclusion is subject to one qualification. To the extent that the quality of education is improving all the time, so that each new cohort of school leavers is better educated than the last, estimates of lifetime earnings from current earnings do understate the expected rate of return on education. Balogh and Streeten seem to have this in mind when they say: 'Since the time-flow over a lifetime of the earnings of the educated is quite different from that of the uneducated, lifetime earnings now must be calculated as returns on education in the nineteen-twenties. To conclude from those returns anything about today's returns is like identifying a crystal radio set with Telstar.' Unfortunately, we know very little about secular changes in the quality of educational output. We cannot even agree on the meaning of 'quality' in education, and so far there have been few serious efforts to measure it. Still, the best guess is that it has been improving at all levels. But to compare it with improvements in the output of the radio industry over the last generation is to grossly exaggerate a well-taken point.
>
> "The possibility of error in the projection of lifetime earnings can be built directly into the calculated rates of return, in the form of an upper and lower limit for each stated error-factor. Suppose we had over or underestimated next year's earnings

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[21] M. Blaug, "The Rate of Return on Investment in Education in Great Britain," Manchester School, XXXIII (September 1965), 213.

> differentials associated with extra education by one per cent., and the following year's differentials by another one per cent., compounding the error each year by a further one per cent.; this mistake would mean that earnings differentials fifty years hence would in fact be more than 50 per cent. greater, or about 35 per cent. less, than what we had assumed. Nevertheless, as is shown in the appendix below, this would only reduce the rate of return on investment in education by about one per cent., for the simple reason that the early years get a much heavier weight. The rate of return is not sensitive to the entire age-earnings profiles of educated people; provided we correctly project the next five or ten years' earnings, significant shifts in earning patterns in three or four decades do not substantially affect the results."[22]

Finally, the Bowman article on concepts and measurements of human capital discusses alternative measures of educational quality including number of years of schooling completed, "efficiency-equivalence" of graduates in different time periods, and the use of "base-year lifetime earned incomes."[23] It does not discuss how cross-section data might be used to perform the alternative calculations.

Summary.--Secular change in educational quality has not been measured by my study in its present form. Some evidence of its existence appears in the age-income profiles for graduates of certain specialties and is supported by interviews with persons familiar with the composition of the curriculum over the past years. Measurement of the impact

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[22] Ibid., pp. 223-4. Footnotes in the original article have been omitted, also appendix referred to.

[23] Mary Jean Bowman, "Human Capital: Concepts and Measures," Economics of Higher Education, ed. Selma J. Muskin (Washington, D.C.: U.S. Department of Health, Education, and Welfare, U.S. Government Printing Office, 1962), pp. 69-92.

of such change on professional incomes appears to require additional historical data on the content of the several courses and/or income data from other time periods.

Capitalizing income flows reduces the potential impact of specification errors caused by ignoring secular quality change. On-the-job training also tends to "level" differences in the quality of formal education received.

To improve the predictive value of calculated rates of return, any quality change function (or functional) estimated from historical data must be assumed to remain constant or its future change postulated.

Rates of Return

This study calculates the internal rate of return to estimated investment in education for various curricula at the university level. An alternative calculation could have been performed to estimate the discounted or capitalized cost-benefit ratios from these investments. Cost-benefit ratios require the use of a real cost of capital figure (real interest rate).[24] On the other hand, the internal rate of return calculates the real "interest rate" on educational investment, which can then be compared with alternative investment rates of return that may differ depending on types of risks, differing capital markets, etc. The use of a net present value also requires the assumption of a market rate of interest and therefore has the same disadvantages as the cost-benefit calculations.

Returns to human capital investment would be expected to exceed returns to investment in most forms of non-human capital.[25] Human income includes depreciation on human capital investment as well as return to that investment. Non-human income does not generally include depreciation. Once human capital has been acquired, it is inseparable from its owner and requires work by its holder to be valuable. This

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[24] G. David Quirin, The Capital Expenditure Decision (Homewood, Illinois: Richard D. Irwin, Inc., 1967) pp. 35-49.

[25] B. P. Pesek and T. R. Saving, Money, Wealth, and Economic Theory (New York: Macmillan, 1967) contains an excellent discussion of the implications of investment in human versus non-human capital.

nseparability also means that it disappears upon the death of the holder. It cannot be sold (barring slavery) nor raded for an alternative asset. This lack of liquidity and enerally high risk element should produce rates of return n excess of rates associated with most alternative investents. How much higher will depend on conditions in all of ne capital markets within the economy.

Other Expectations

In addition to Age and Course Completed, ten other lasses of variables are investigated for possible statisical relationships with income. The expected influence of nese classes is presented below.

Years of University Completed.--To the extent that ears of university completed is consistent with increased ducational investment, higher average incomes would be pected, although not necessarily higher rates of return.

Sex.--The social structure of Brazil would lead one to ticipate that women at a given level of educational train- would be subject to a certain degree of wage discrimina- n. The possible part-time employment of women would so produce lower average incomes.

Head of Family.--Persons with a family to support ld be expected to earn more than those without, both from standpoint of motivation after the fact and from the ndpoint that those with higher incomes could afford to e families.

Religion.--Brazil is basically a Roman Catholic ountry, although much of the population is not actively ngaged in church participation. Income comparisons of rotestants, Jews, Roman Catholics, and "Others" may give ome evidence of the existence or lack thereof of a "Prot- stant work ethic." The existence of economic discrimination ased on religion might also be identified.

Race.--The racial composition of Brazil consists of rge numbers of mulattoes resulting from the intermixing f the original Portuguese settlers, indigenous natives, and fr ican slaves. The non-white population varies greatly, th the North Region containing large numbers, while in the uth the non-whites are relatively small in number. The untry and its people have prided themselves on the lack of cial problems or discrimination. Earnings differentials e investigated to determine if the labor markets reflect onomic discrimination within the educational specialties udied.

Children.--It is to be expected that this variable uld produce results consistent with the variable "Head of ni ly" for the same reasons of motivation and/or necessity.

Class of Activity.--Differences in incomes between rsons of similar educational background will be studied as e measure of labor market homogeneity. Small earnings fferentials would provide evidence of competitive markets administered wages). Large differences are investigated

to see if they represent market imperfections, non-money income elements, or differences in the productive quality of persons employed.

Position.--Income differences between the public and private sectors are determined, and within the private sector, the differences between the employed and self-employed.

Migration and Environment.--It is expected that in the aggregate, those with a history of migration would have higher incomes than those without, since migration would indicate a willingness to respond to incentives for change. Those with urban environments would be expected to have higher incomes than those in suburban or rural areas. An almost universal comment heard in the interviews was the difficulty of obtaining professionals for employment in rural areas. Significant income differences would explain a portion of this problem.

Method of Analysis

Regressions of log income on several groups of variables are performed using the following general linear model:

$$Y = a_o + \sum_{i=1}^{k} a_i x_{ij} + u_j$$

where i = (1,2,...,k) independent variables, j = (1,2,...,n) observations in the sample, and u_j is the unobserved error term of the j^{th} observation. There is no a priori reason to expect a specific form of the function relating log income to the independent variables, and many of the variables used

are qualitative rather than quantitative, such as sex and race. Binary variables that take the value of zero or one are used, therefore, to represent all of the independent variables.[26] One "dummy" in each class (e.g., "Age") is omitted to avoid matrix singularity.[27] The intercept term estimates the log income of persons having the characteristic(s) omitted from the regression. The regression coefficients express the difference between the geometric mean of the cell of observations of the variable in question and the geometric mean of the cell of observations omitted in that class. Thus, for example, in a regression of log income on eight different age variables, one age group is omitted--in the studies that follow, "Age 39." The intercept term gives the mean of log income for the cell of observations of persons with mid-point age of thirty-nine years. The regression coefficient for the variable "Age 49" expresses the logarithm that must be added to or subtracted from the intercept term to arrive at the log income of the cell of observations for mid-point age of forty-nine.

Homoscedasticity is assumed; but should this assumption be incorrect, no bias is imparted to the results--only efficiency in the form of increased variance. Additivity the influences of the different classes of variables is

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[26] J. Johnston, Econometric Methods (New York: McGraw-Hill, 1963), pp. 226-27.

[27] Ibid., pp. 221-22.

also assumed. The validity of this assumption is, however, specifically discussed later in this chapter.

The correlation coefficients measure the degree of income variance "explained" by the variable in relation to the intercept term. Likewise, the "t" value for each regression coefficient permits determination of the significance level of the regression coefficient in explaining income variance around the omitted class. These "t" values do not indicate the significance of a coefficient in explaining absolute income variance, but rather the significance of the difference between the mean value of that cell and the mean value of the intercept cell.[28]

The $\bar{R}^2$ value for the total regression measures the explained variance around the omitted variable(s) and the "F" statistic also measures the significance of explained variance around the intercept value of the omitted variable(s). As more variables are added to regressions for a specific sample, increases in the $\bar{R}^2$ reflect the influence of the variables added.

Differences in the number of observations in different cells must be considered when evaluating the coefficients of determination. For example, a regression of log income on race alone when use is made of the Espírito Santo University graduate sub-sample indicates that less than one percent of

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[28] See the discussion that follows regarding significance of the age-income profiles derived from the regressions.

income variance is explained by race ($\bar{R}^2$ = .0060). This is not to say that significant differences do not exist between incomes of different racial groups. In fact, the white earnings are significantly greater than non-white earnings at a level in excess of ninety-nine percent. Since there are only thirty-nine non-whites in the sample of 604 persons, a large non-white income difference does not appreciably influence total income variance of the sub-sample.

Only simple correlation coefficients are calculated which indicate the importance of the independent variable(s) in explaining log income variance around the omitted variable(s), all other factors variable (mutatis mutandis). Potential interdependence among classes of variables is investigated by comparing $\bar{R}^2$'s. For example, using Espírito Santo University Graduates as a sample, a regression on Age alone produces an $\bar{R}^2$ of .0706, and on Years of University Completed alone an $\bar{R}^2$ of .0991. Summing these two gives an $\bar{R}^2$ of .1697; however, when a single regression is made on both classes an $\bar{R}^2$ of .1771 results. Hence, only slight interdependence is present between these two variable classes.

Regressions using income and log income as the dependent variables were performed on data from several different samples. Log income results were consistently of greater significance than those using income. For this reason, log income is used throughout the study. The tables of regression results in Appendix I show a column entitled "Antilog Log Income."

This was computed by adding the regression coefficient (a logarithm) to the intercept term and taking the antilog of the sum. The intercept results in the tables are also the antilog of actual intercepts.

The following classes of independent variables are included in studying income variance: Years of University Completed, Age, Course Completed, Sex, Head of Family, Religion, Race, Children in Family, Class of Activity, Position in Occupation, Migration, and Rural/Urban Environment. Separate series of regressions are performed for the total sample as well as the following sub-samples for each region: All University Graduates, All Secondary Graduates, Graduates of Philosophy, Medicine, Dentistry, Pharmacy, Engineering, Law, Agronomy, Economic and Political Sciences, and "All Other Courses Completed." In addition, sub-samples containing persons completing each year of university training (one year through six) are studied.

The assumption is made that all income differences between university graduates and secondary graduates are the result of increased education. This is clearly questionable since, as shown by the regressions, other factors have significant correlations with professional income. The problem is to separate those factors which themselves are unrelated to educational attainment. For example, Class of Activity and Years of University Completed may have interdependent relationships. While this interdependence will be discussed, the

age-income profiles used in rate of return calculations will reflect the mutatis mutandis operation of all variables rather than a ceteris paribus assumption. Within the population, women may (and usually do) earn significantly less than men. Thus, there are different rates of return for women and men, which could be separately computed. The purpose of this study, however, is to derive a rate of return to various educational backgrounds for the average of all persons in each sub-sample studied. Variations from these averages are discussed but not explicitly converted into different rates of return.

The significance of the cell means used to prepare age-income profiles is not necessarily reflected by the standard error or computed "t" value of the coefficient. In this case, the "t" value measures the significance of the regression coefficient in explaining differences between the mean of the given cell and the mean of the cell of omitted observations. If, for example, the mean log income of Age 39 (the omitted class) is 2.50000 and the mean for Age 59 is also 2.50000, assuming no interaction between the variables Age 39 and Age 59, the regression coefficient of the cell Age 59 will be zero, thus producing a computed "t" value of zero as well. Age 59 could still be correctly estimated with a high degree of precision if the income variance within the cell is low. The regression techniques used do not permit evaluation

of this situation. Conversely, however, a high computed "t" value would indicate a significant mean, computed from the regression coefficient.

The age-income profiles described above yield my estimate of social income as previously defined. Private income is measured by subtracting income taxes paid by the individual from his gross income. The costs used in calculating social and private returns have been described and discussed earlier. Social costs include all tangible costs of the university training to society. In the computations that follow, they will be considered with and without capital costs. Private costs are those borne by the student and/or his family, including income foregone.

The rates of return are computed by capitalizing and equating the expected costs and income flows to the end of the working life horizon--in this study arbitrarily set at Age 69.

$$\sum_{t=18}^{m} (1 + r)^{(69-t)} C_t = \sum_{w=m+1}^{69} (1 + r)^{(69-w)} R_w$$

$$t = (18,\ldots,m); \quad w = (m+1,\ldots,69)$$

where C_t equals the cost in the t^{th} period during university attendance; R_w equals the income flow attributable to the educational level in the w^{th} period following university attendance; and r the internal rate of return. The root r is calculated using the Newton-Raphson method of successive

tangential approximation to a neighborhood estimate. These neighborhoods were variously chosen in a range of from five to sixty percent with no variations in the results which indicates that in the expected range only one positive root exists.

CHAPTER III

DATA

The 1960 Decennial Census of Brazil.--A major portion of the data used in this study is based upon information contained in the 1960 Census, a brief review of which is presented below.

The organization charged with the responsibility of planning, collecting, processing, and publishing the Brazilian demographic and economic statistics is the Serviço Nacional de Recenseamento (SNR) of the Instituto Brasileiro de Geografia e Estatística (IBGE). In 1960, this organization operated under the Ministério do Planejamento of the federal government. A change in its status was made in October 1967 to that of a quasi-independent Fundação, with major financial support from the federal government but with less political control over policies and operations. There is general agreement among persons familiar with the operation of the SNR and IBGE that prior to 1960 the quality of census operations and results was comparable to that of many developed nations in the Western world.[1] The 1960

[1]For example, interviews with Dr. Isaac Kerstenetsky, Instituto Brasileiro de Economia of Fundação Getúlio Vargas, Rio de Janeiro, July 1967, and Mr. Merton V. Lindquist, U.S. Bureau of the Census, then working with IBGE under USAID contract, August 1967.

Census was beset by many problems, some of which remained unresolved in mid-1968. For the first time, two types of questionnaires were used. One contained the usual demographic questions and was used to collect information for all households in the population. Every fourth household enumerated answered additional questions regarding income and economic activity, thus producing a systematic sample consisting of twenty-five percent of the total domiciles. Questions were administered primarily by enumerators hired on a short-term basis specifically for this task. They were chosen by the IBGE Inspector in each município from persons who had passed a general information type of examination prepared by IBGE for the selection process.[2] Following this, the enumerators were given several training sessions conducted by the local Inspector and at least one session conducted in the State capital by the Regional (State) Inspector. In both planning and execution, the collection phase of the Census has not been seriously criticized. From that point on, however, serious problems arose. Among these was the fact that, in many cases, pay for the enumerators was delayed for periods up to a year or more. In addition to waiting for their money, these people also found that inflation had seriously reduced its purchasing power. This resulted in a broadly based group of people ready to

[2]The Brazilian município is a political unit roughly equivalent to a U.S. county.

criticize any and all aspects of the SNR. Concurrently, UNIVAC computers had been purchased to process the data contained in the questionnaires. Without discussing the merits of these machines, it is sufficient to say that they failed to perform the necessary work within the estimated time required. Lack of parts, technical support, and funds all contributed to the situation in 1968 which found only fifteen percent of the total Census completed, verified, and published. Numerous political factors in the management of both the SNR and its parent, IBGE, further inhibited efficient data processing. As an example, after the questionnaires had been returned to Rio, the work of transcribing the information on computer punch cards was begun. A substantial error in estimating the time required for this operation had been made, and the work dragged out over several years. As the cards were punched, they were stored in common storage with no humidity or temperature control. Rio's weather succeeded in reducing much of this work into soggy pulp before the cards were utilized.

Following the revolution in March 1964, many reforms were carried out within IBGE and SNR. Several problems remained including a shortage of funds, a computer that functioned only sporadically, and a large portion of work that had to be completely redone (the punch cards). Considering these problems, remarkable progress in processing the Census was made following the Revolution. Using a complex system of

internal consistency controls, often going back to the original questionnaires, the twenty-five percent sample and the universe were processed and verified in a parallel operation. At the time of this writing, results for the following states and territories have been completed: Amazonas, Pará, Acre, Rondônia, Roraima, Amapa, Espírito Santo, Guanabara, and Santa Catarina. Results for the balance of the country are expected by June or July of 1969.

Numerous persons have been interviewed concerning the quality of the Census and the history above is a résumé of most of their thinking.[3] One criticism remains unanswered. In states with vast land areas and poor means of communication, the accuracy of the rural census is questionable. In terms of this study, the criticism is most applicable to the rural areas of the North Region. Since persons who had completed secondary school or more were scarce in rural regions, it is doubtful that my results are seriously affected by this potential omission in sampling. The other critics of the Census confine their comments to matters of timing, management, and efficiency, particularly during the period of 1960-64. Some preliminary results based on a 1.27 percent sample were published in 1965. Punch cards prepared from the original questionnaires were selected, supposedly at random, from the total population and results computed. The results

[3]See the list of interviews contained in the Appendix III.

have since shown that the selection process was decidedly non-random and that many of the cards used were erroneously prepared. The final processing of the SNR on which this study relies has overcome the defects of the preliminary estimates.

The Twenty-Five Percent Sample.--The responses to the detailed questionnaire used for every fourth household are contained on separate magnetic computer tapes in the SNR. Again, a series of internal consistency controls were imposed on each individual's record during the verification process. Thus, such cross-checks as age versus possible education and income were established to signal a record which might contain gross errors. Such records were then rechecked for punching errors, if necessary, with the original questionnaire. In areas where comparison of the sample with the total Census indicated an actual sampling different from the one-in-four standard, weights were calculated and applied to obtain corrected results. There was no attempt to obtain a one-in-four relationship within each sub-group (such as doctors, lawyers, etc.) as is shown in the Tables of Sample Composition in Appendix I. For example, in Espírito Santo the employed sample used in the study ranges from a low of eighteen percent of total graduates (for Pharmacy) to a high of forty percent (for Geography and History graduates). The average for the combined university and secondary population is twenty-six percent--close to the twenty-five percent of the total population that was the target.

It is from this twenty-five percent sample that much of the data for the study are taken. For each state or region covered, a computer tape was prepared containing the full Census record for each person who had completed the segundo ciclo médio level of education or more. Segundo ciclo médio (secondary school) is the minimum level of formal education required for university admittance. Thus, Census responses are included for all persons in the sample who had completed secondary school, any part of a university course, or any complete university course. The additional criteria used in selecting the regression sub-samples used in the analysis of income variance and rates of return are (a) that the person was employed with an income and (b) that he was not a seminary graduate. Seminarians were eliminated because it is doubtful if the market wage reflects a significant part of the benefits they receive.

Responses to the following questions are used in the study of income variance. The meaning of the relevant questions is discussed briefly.

Questions M and N. Level of Education Completed.--Eight levels of education and attainment may be reported in response to this question, namely, a secondary graduate with no university training, an enrollee in the first year of university at the time of the Census, or persons having completed satisfactorily one through six years of university. There is no way of identifying completion of post-graduate work and anyone completing more than the six-year level was included

in the six-year group. The total years of university attendance are not necessarily reflected in this response. To the extent that "repeaters" occurred, the estimated costs of education are understated. Among first-year students particularly, this can be a problem. For example, if a student is attempting to enter a medical school, he may take entrance examinations for both medicine and pharmacy. If he fails entry into the medical school, yet passes the simpler pharmacy examination, he can then enter pharmacy for one year, continue to study for the medicine examination the following year, pass same, and enter first year of medical school. At the completion of his first year of medical training, the Census would report him as having completed only one year of university (the highest level attained with approval in the current curriculum). The magnitude of this problem does not appear to be large. Table 5 shows the average age of first-year university students to be approximately twenty-two years and that of fourth-year students, slightly over twenty-six years. The age distribution of the student population in 1960, at least, does not reflect a large number of repeaters.

Question D. Age.--For all persons over one year old, the response is supposed to be the age at the birthday previous to the Census. Hence there exists a small degree of downward bias.

The small sample population of each age group, particularly when broken into sub-samples, tends to introduce wide

income fluctuations if the data are presented for one-year class intervals. In addition, one-year intervals result in an unmanageable number of variables in regressions using dummy variables. After trying several different methods of grouping ages, the following selection was made:

Age Group	Midpoint
18 - 19	19
20 - 24	22
25 - 29	27
30 - 34	32
35 - 44	39
45 - 54	49
55 - 64	59
65 and over	68

This grouping also facilitates later intercountry comparisons since several other studies of returns to education have used these age classes.

Question 0. Course Completed.--The educational specialty of the person is reported in this response. Although secondary graduates also reported specialties, they are not used in this study. The responses of university graduates indicate the faculdade from which they graduated or were enrolled.

Several "Courses Completed" need further description. Graduates in "Philosophy" as reported in the Census completed courses in one of the following specialties: Geography;

Natural History; Languages and Literature; Mathematics, Sciences, and Descriptive Geometry; "Other Courses" in Philosophy. Graduates either prepare for work in these fields and obtain a bacharelado degree, or more generally, they prepare for teaching at the secondary level and receive a licenciado degree which allows them to teach. By far the larger number of Philosophy students is graduated as teachers. "Economic Sciences" is generally a combination of accounting, business administration, and a little economics. The "Law" curriculum generally includes a large "liberal arts" content, and the significance of this is discussed in Chapter IV.

Question B. Sex and Presence.--In addition to indicating the sex of the person concerned, his physical presence or absence from the domicile at the time of the Census is reported.

Question C. Relationship with Head of Family.--The response to this question is used to determine whether the person was or was not a head of family at the time of the enumeration.

Question E. Religion.--Nine possible responses are provided by the questionnaire: Roman Catholic, Protestant, Spiritualist, Buddhist, Jew, Orthodox, Mohammedan, Other Religion, and No Religion. In establishing my variables, these categories are combined into Protestant, Jew, Roman Catholic, and Other.

Question F. Color.--Permitted answers include only White, Black, Yellow, Mixed and Indian. The last category was to be used only to describe those persons living in Indian reservations or preserves. Unfortunately, there were no objective standards to determine who was white, black, etc. The judgement of the census taker was used exclusively and it is certain that wide differences in opinion existed. For the purpose of the study, the categories include only White, Black, and Other. At least a rough measure of the relationship between race and income can be gotten in this way. Interviews also indicate a probable "whitening" of the population with higher incomes and educational levels in terms of the subjective opinion of the enumerator.

Question S. Number of Living Children.--The question asks how many of his children the person believed to be alive at the time of the Census. Only the fact of having children or not having children is used in the study.

Question X. Class of Activity.--The Census questionnaire groups economic activity into the following nine classes: Agriculture, Extractive Industries, Manufacturing Industries, Commerce, Transportation, Service Industries, Government Service, Liberal Professions, and Social Services. Within these main groups, there are more than one hundred sub-classes each carrying a separate code. Only the main classes are used in this study due to the limitation on numbers of computable regression variables as well as the reduction in observations in each characteristic cell below

meaningful levels. "Agriculture" includes only activities involved in raw material production. Processing functions are included in the "Manufacturing Industries" category. "Extractive Industries" includes mining, lumbering, and rubber gathering. "Manufacturing Industries" includes production and initial marketing functions. "Commerce" contains all other marketing activities at both wholesale and retail levels as well as financial operations. "Service Industries" includes hotel and restaurant operations, repair facilities, personal services, and domestic services. "Transportation" covers all phases of the industry on land, sea, and air as well as storage operations. "Government Service" includes persons whose primary income is from a government payroll. It does not include part-time employees with other primary income sources nor contract personnel. Military personnel are also in this category. "Liberal Professions" includes individuals operating private offices for professional services such as doctors, lawyers, and engineers. "Social Services" includes school teaching and administration, public health, and church activities as well as private medical assistance when carried out through a clinic or hospital. Specific occupation as compared to general class of activity was also asked for in a separate question (Question V), Due to the great number of possible responses, this variable is not used in the study.

Question Z. Position in Occupation.--The choices given in answering this question include Private Employee,

Private Employer, Working for Own Account, Partner or Share-worker, Public Employee, and Member of Family or Institution (such as priests, etc.). The variables actually used are Public Employee; Employer or Working for Own Account (Self-Employed); and Private Employee, Partner, Share-worker, or Member of Family.

Question I. Migration History.--If the person enumerated had not lived in the município that was his current home, he was asked whether his immediately previous home had been in a rural or urban environment. In this case, the respondent was the judge of the nature of his previous home.

Question "Situação." Current Environment.--The location of the domicile enumerated was classified as Rural, Suburban, or Urban by the census taker. This classification was based on the definitions made by the governing body of the município (Câmara dos Vereadores). The nature of the existent tax structure provided incentives to classify areas as "urban" or "suburban" which probably has imparted an urban bias to the data. No nationwide nor statewide standards were used in making this determination--only the decision of the local câmara as reviewed and approved by the state government.

Question L. Attending School and Literacy.--A subsample of persons indicating they were still attending school was prepared and used to determine the age and income characteristics of the university student population in 1960.

Question T. Monthly Income.--All persons were asked to report their average monthly money income for the previous twelve months (1 September 1959 - 31 August 1960) in what are now referred to as "old cruzeiros."[4] Persons with irregular income flows were asked to average such flows for the previous year to allow reporting of a monthly figure. Only the following were supposed to be omitted from the reported income: loan receipts, inheritances, annuities or other capital receipts, costs of capital assets sold, gambling winnings (except in the case of a professional gambler), and income in kind.[5]

The income classes reported and the representative figures for each class were chosen as follows:

Census Class Monthly Income (cruzeiros)	Representative Monthly Income (cruzeiros)
Less than 2,100	1,500
2,101 - 3,300	2,700
3,301 - 4,500	3,900
4,501 - 6,000	5,250
6,001 -10,000	8,000
10,001 -20,000	15,000
20,001 -50,000	35,000
50,001 and more	100,000 to 200,000

[4]On 7 February 1967, the "new cruzeiro" was created. It represents the old cruzeiro divided by 1,000. The rate of exchange in 1960 averaged 188 old cruzeiros to the U.S. dollar.

[5]Brazil, Instituto Brasileiro de Geografia e Estatística Serviço National de Resenceamento, Instruções ao Resenceador. c.d. 9 (Rio de Janeiro: 1960).

The representative figure for the open-end class "Over Cr$50,000" per month was estimated by calculating a Pareto distribution for the total employed population of each state or region. Research in other countries indicates the Pareto distribution accurately describes income distribution in the upper tail but is less descriptive of the lower income groups. I therefore calculated the distribution using all seven closed classes and again with only the upper five closed classes. The results of these calculations are shown in Table 1 together with the actual figure chosen to represent the open-ended class in each area. In all cases, very high coefficients of determination (r^2) indicate excellent "fits" for the Pareto regression estimates. The value of the "Less than Cr$2,100" per month class was arbitrarily set at Cr$1,500. For this study, it is of little importance since few persons in either the secondary or university groups reported this level of income.

Census Data Selection.--Figure 4 shows the areas studied. The choice of states was based solely on the availability of the 1960 data and represents about thirteen percent of the country's population. The data probably contain a larger proportion of secondary and university graduates than existed in the country as a whole due to the large and atypical population of Guanabara. While there is a risk in extrapolating the results to represent "Brazil,"

TABLE 1

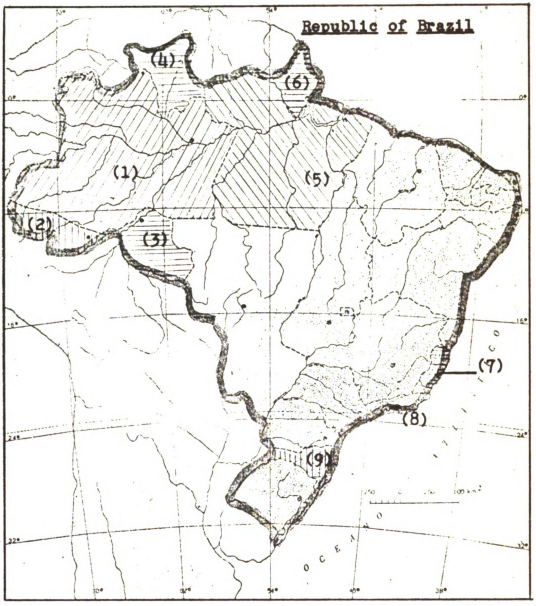
INCOME DISTRIBUTION CALCULATIONS[a]

	Total Sample	Espírito Santo	North Region	Guanabara	Santa Catarina
"Over Cr$ 50,000" class mean with all closed income classes[b]	178,953	116,935	107,320	298,812	108,350
Pareto Coefficient	-1.3877	-1.7470	-1.8723	-1.2010	-1.8569
r^2	.9624	.9897	.9797	.9223	.9766
"Over Cr$ 50,000" class mean with upper 5 classes[b]	131,982	107,847	98,154	152,358	97,411
Pareto Coefficient	-1.6099	-1.8643	-2.0383	-1.48885	-2.0546
r^2	.9956	.9998	.9986	.9847	.9976
Mean chosen for area		110,000	100,000	200,000	100,000

[a]Calculated from: Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, Censo Demográfico de 1960.

[b]Calculations based on Lawrence R. Klein, An Introduction to Econometrics (Englewood Cliffs, N.J.: Prentice-Hall, 1962) pp. 150-54.

Figure 4
Areas Included



(1) Amazonas
(2) Acre
(3) Rondônia
(4) Roraima
(5) Pará
(6) Amapá
(7) Espírito Santo
(8) Guanabara
(9) Santa Catarina

the areas included do represent much of the diversity found in the country. Some basic information on the four regions studied is provided in the following paragraphs.

1. State of Espírito Santo.--Of the twenty-six states and territorities that make up the Republic of Brazil, Espírito Santo ranks twenty-first in land area (45,597 square kilometers). Its 1960 population of 1,169,000 ranked seventeenth in number of inhabitants. The Census classified 352,500 or thirty percent of the population as "economically active" and of this group, approximately sixty-eight percent was in agriculture or extractive enterprises, six percent in industrial activities, and twenty-six percent in "other activities" (services, government, commerce, etc.). Approximately one percent of the total population had completed secondary schooling or higher levels, and two-tenths of one percent had completed the university level. The state has characteristics found in many other parts of Brazil. Its agriculture is based primarily on the traditional crops of coffee and cocoa. Its industry is generally of small scale and supports extractive enterprises. As with all of the areas studied, the professional population is concentrated in urban areas.

2. The States of Acre, Amazonas, and Pará plus the Territories of Rondônia, Roraima, and Amapá.--These units comprise the Northern Region of Brazil. Their combined areas

of 3,581,180 square kilometers make up forty-two percent of the total area of the country while the 1960 population of 2,579,000 represented only 3.7 percent of the inhabitants.

The economically active group was thirty percent of which sixty-six percent was in agriculture, six percent in industry, and twenty-eight percent in "other activities." Only seven-tenths of one percent had completed the secondary level or more but, as with Santa Catarina and Espírito Santo, two-tenths of one percent had completed a university curriculum. The region represents a large portion of Brazil's "frontier" with economic activity based almost solely on traditional agriculture and extractive industry. The data for this group of states and territories have been processed together because of the small size of some of the units as well as the similarities of the societies and economies. The area is integrated in many ways by the transportation provided by the Amazon River system.

3. The State of Guanabara.--At the time of the 1960 Census, the State of Guanabara had just lost its position as the seat of the federal government. The loss at that time was in name only since most of the governmental functions were still carried out in the city of Rio de Janeiro, the urban limits of which form the boundaries of the state itself. The area is only 1,356 square kilometers, but the 1960 population was 3,307,000 people. Those persons with secondary or higher education made up 6.18 percent of the population

with 2.26 percent having university degrees. A higher percentage of the population was economically active (35.84 percent) than in the other areas studied. Of this group, 1.78 percent was in agriculture, 20.17 percent in industry, and 78.05 percent in "other activities." Government employment made up approximately twenty-five percent of "other activities."

4. The State of Santa Catarina.--This state ranks eighteenth in area with 95,985 square kilometers and eleventh in 1960 population with 2,147,000 inhabitants. Its economy is somewhat more diversified than the other regions in the study. Thirty percent of the population was economically active within which sixty-three percent was in agriculture, eleven percent in industry, and twenty-six percent in "other activities." Only six-tenths of one percent of the population had completed secondary schooling but one-third of these (two-tenths of one percent) had finished a university course.

Census Data Verification.--Inaccuracies in the Census data could be produced by a poorly executed census or by reporting errors. Interviews referred to earlier in this chapter indicate that the quality of the final results of the Census is probably good. Income overstatement or understatement on the part of people reporting their earnings to the census takers is very difficult to evaluate. There are almost no income studies available for the 1960 period which

might be used to cross check the Census information as it is broken down by professions for use in this study. From an aggregate viewpoint, a recent paper compares the 1960 Census data on incomes for the state of Espírito Santo with income data for the same state from the National Accounts of the same period.[6] It tentatively concludes that the order of magnitude of income, as published from the two sources, is consistent. This does not necessarily imply that the income reporting of persons contained in my sub-samples is correct since they represent such a small portion of the total population. Major under or overstatements would affect only slightly the aggregate results of the study cited.

Interviews were held in each of the areas covered by the study. Attempts were made to contact men in each of the major professions requiring a university degree. In general, these men were leaders in their fields and had been active during the 1959-60 period. Many were associated with university faculties in their respective states. Others were leaders in the various professional associations. The primary purpose of these interviews was to obtain general opinions as to the accuracy of the income data regarding both the levels and the shapes of the age-income profiles produced by the calculations. In no case were the numbers of people

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[6] F. S. O'Brien, "A Preliminary Study of Income Distribution in Brazil," unpublished paper for Brazil, Ministério do Planejamento e Coordenação Econômica, Instituto de Pesquisa Econômico-Social Applicada, (Rio de Janeiro: February 1968).

interviewed sufficient to constitute a statistically significant sample from which a quantitative check could be made of the Census data. The specific responses to interview questions are presented in Chapter IV and Appendix I in connection with the sub-samples in each area. Almost unanimously, those interviewed were of the opinion that the average income figures calculated from the Census data represent a reasonable estimate of income from non-property sources, or in other words, from labor. In their opinion, income from investments or property had not been declared to any large extent. As a result of these interviews, I concluded that it was unnecessary to reduce reported incomes to remove the non-labor component not related to investment in university education. Thus, the assumption is made that reported income does represent "labor income."

Educational Costs.--Social and private costs as defined in Chapter I are estimated on a per student basis. The several components of these costs are as follows:

1. Social Costs without Capital.--Included under this heading are direct university costs such as faculty and administrative personnel salaries, building maintenance, books, etc. In addition, imputed costs are included as measured by the value of the product foregone by society during the time students were attending universities instead of being productively active in the economy.

2. Social Costs with Capital.--This category adds to the above expenses the costs related to the investment in

physical assets of the educational institutions. The direct element consists of depreciation on these assets. The imputed portion is made up of interest that could have been earned by society on similar principal in an alternative investment.

3. Private Costs.--Direct private costs are those incurred by the student or his family resulting from his attendance at an institution of higher education. They include only additional expenses that would not have resulted had he foregone the university training. Thus, such items as "basic" food, clothing, and shelter are not part of this cost. Imputed private costs include the foregone income of the student during the period of his university attendance.

The income data from the 1960 Census are given as a monthly figure. For uniformity, all income and cost data are reduced to a monthly basis. Educational costs are spread to a twelve-month base even though the school year ranges from six months to nine months.

Estimates of Social Costs without Capital are based on a publication prepared in 1963 by the Serviço de Estatística da Educação e Cultura of the Ministério da Educação e Cultura (SEEC) which included average annual expenditure figures for different institutions of higher education throughout Brazil.[7] The data is presented by educational

[7] Brazil, Ministério da Educação e Cultura, Serviço de Estatística da Educação e Cultura, Sinopse 1961 (Rio de Janeiro: 1964).

specialty such as law, medicine, engineering, etc. for the year 1961. These figures are based on a questionnaire sent to the 1,093 school units of higher education that were recognized by the federal government at the time (485 private and 608 public). Some 473 of these responded providing the information on which the calculations were made. The failure of others to report and the non-random nature of the sample are not the serious defects they at first appear to be because the reporting institutions enrolled over ninety percent of all students.

Several problems exist with these data. First, disbursements (despesas) of the schools are presented, not costs. The differences between "costs" and "disbursements" are as follows. First, there may be payments for goods and services received and used during the previous year. Similarly, goods and services may have been received and not paid for. There is no way of estimating the difference this factor may cause. It is therefore assumed that these two possibilities offset each other. The second difference between costs and disbursements is the inclusion of capital expenditures in the latter category. For example, the cost of a new building with a twenty-year useful life may be included in its entirety under disbursements whereas an accurate cost figure would include only the depreciation on the building for the given year. Fortunately, the questionnaire asked that such expenditures be included under a single heading of "works" (obras)

so that it is possible to separate capital expenditures from other disbursement items. The data include no allowance for depreciation nor is any estimate of the value of existing stocks of capital goods made.

Columns (1) through (7) of Table 2 utilize the data contained in the SEEC study to estimate direct social costs per student for 1961. There are two disbursement categories in the SEEC report for scholarships and student assistance. In general, these monies are used by students for subsistence expenses. From a social cost point of view, they largely replace similar subsistence payments from other sources (e.g., parents), and therefore do not represent additional expenses to society as a whole. These categories are eliminated from cost calculations. The capital expenditures category (obras) is also not used but capital costs are estimated in a manner described below.

The direct costs for 1961 are deflated to the 1960 price level using the Index of General Prices (Except Coffee) prepared by the Fundação Getúlio Vargas. This index is the most widely used measure of Brazilian general price movements. Fundação Getúlio Vargas is a non-governmental foundation which does much of the official statistical calculations for the country including the National Accounts. Coffee is excluded because the volume of transactions in this commodity on the external market could distort estimates of domestic price movements. Ideally, only changes in university costs

TABLE 2

UNIVERSITY COST CALCULATIONS - BRAZIL, 1960

Schools	Faculty Personnel Cr$ x 1,000 (1)	Adm. Pers. Cr$ x 1,000 (2)	Material Cr$ x 1,000 (3)	Other Cr$ x 1,000 (4)	Sub-total Cr$ x 1,000 (5)	Students (6)	Costs Per Stu./Yr. (7)	Cost/Stu. /Yr. Deflated (8)	Costs /Stu./Mo. (9)	Deprec. /Stu./Mo. (10)	Sub-Total (11)	Foregone Interest /Stu./Mo. (12)	TOTAL COST /Stu./Mo. (13)
All Reporting Units	7,379,376	2,539,780	2,276,853	989,832	13,185,841	98,952	133,255	91,133	7,594	6,065	13,659	7,278	20,937
Law	373,040	113,971	62,081	44,164	593,256	17,645	33,622	22,994	1,916	1,577	3,493	1,892	5,385
Medicine	995,199	707,907	745,430	110,141	2,558,677	9,133	280,157	191,599	15,967	13,221	29,188	15,865	45,053
Engineering	853,545	285,564	171,216	171,564	1,481,889	8,946	165,648	113,287	9,441	7,884	17,325	9,461	26,786
Agronomy	394,808	152,014	146,009	31,185	724,016	2,501	289,491	197,983	16,499	9,825	26,324	11,790	38,114
Philosophy	823,111	173,659	183,179	99,239	1,279,188	21,085	60,668	41,491	3,458	3,760	7,218	4,512	11,730
Dentistry	314,193	77,817	65,563	14,932	472,505	3,280	144,056	98,520	8,210	5,943	14,153	7,132	21,285
Pharmacy	118,353	51,772	31,153	15,386	216,664	947	228,790	156,469	13,039	7,035	20,074	8,442	28,516
Economic Sciences	459,733	134,654	38,149	22,150	654,686	7,084	92,418	63,204	5,267	1,880	7,147	2,256	9,403

Notes:

Columns (1) through (4) taken from Brazil, Ministério da Educação e Cultura, Serviço de Estatística da Educação e Cultura, Sinopse, Despesas com o Ensino, 1961 (Rio de Janeiro: 1964).

Column (6), ibid.

Column (8) deflated 1961 costs to 1960 base using indices contained in Brazil, IBGE - Conselho Nacional de Estatística, Anuário Estatístico do Brasil, 1962 (Rio de Janeiro: 1962).

Column (10) was calculated using a 10 percent straight line depreciation of non-financial assets at book value.

Column (12) was calculated using an interest rate of 12 percent per year.

should be used for the deflation, but since no such index is available, the General Level Index is utilized.

In order to estimate capital costs of university operation, information on the composition and quantity of university capital investment is necessary. Reliable data in this area is very scarce. In 1966, a private group of economists (ERGO) prepared an analysis of some economic aspects of Brazilian university operations. Much of their basic cost information for the 1960 and 1961 periods relied heavily on the SEEC report referred to above. They supplemented this data with studies of the accounts of nine universities located in different parts of the country.[8] Among its results, ERGO estimated a book value for non-financial assets in the universities studied.[9] This figure represents the undepreciated cost of all capital items valued at the time of their construction or purchase as carried on the books of account of the universities. There is no allowance for increases in the money value due to subsequent inflation nor is

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[8] ERGO, Consultôria Econômica e Estatística (Soc. Civil), "Análise Econômica das Universidades Brasileiras," unpublished study prepared for EPEA, Ministério do Planejamento e Coordenação Econômica (2 vols.; Rio de Janeiro: 1966). Universities included are the following: Universidade Federal do Ceará, Universidade Federal de Pernambuco, Universidade Federal da Bahia, Universidade Federal de Minas Gerias, Universidade Federal do Rio de Janeiro, Universidade de São Paulo, Universidade Mackenzie, Universidade Federal do Paraná, Universidade Federal do Rio Grande do Sul.

[9] Non-financial assets include all physical assets but exclude bank accounts, certificates of deposit, stocks or bonds, etc.

there any age breakdown. There is also no division into type of capital reported. The roughly elevenfold inflation during the decade prior to 1960 probably offsets the lack of depreciation deductions in the figures.[10] I used this investment figure to prepare a crude approximation of capital costs for different educational specialties.

The ERGO study contains an estimate of net available floor space used by the different "schools" (faculdades) in the universities sampled.[11] Using these figures, I calculated an over-all average net floor space per student. The net floor space per student in the different specialty schools was determined next. An index was then calculated by dividing floor space per student in the given school by the average floor space per student in all schools (see Table 3). These indices, multiplied by the general average value of non-financial investment per student also contained in the ERGO report, yield estimates of non-financial investment per student in the various disciplines.

The assumption is made that all investment is proportional to square area of buildings. This is at best only a rough approximation. Since neither the age nor composition of the investments is known, a straight line depreciation

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[10]The Fundação Getúlio Vargas Index of General Prices (1948 = 100) gives a 1950 figure of 108 and 1960 equal to 1104. Since no revaluation of assets was carried out during the decade, an asset purchased in 1950 would have money value of only 9.8 percent compared to the same asset purchased in 1960. This is equivalent to having reduced the book value by a depreciation figure over the decade.

[11]Gross floor space less a twenty percent allowance for corridors, stairways, etc.

TABLE 3

AREA PER STUDENT, DIFFERENT FACULTIES - BRAZIL, 1965[a]

Faculty	Area/Student	Percent of Average
Law	6.70 m^2	26
Engineering	32.70 m^2	130
Pharmacy	29.03 m^2	116
Philosophy	15.58 m^2	62
Medicine (W/Hosp.)	54.59 m^2	218
Dentistry	24.68 m^2	98
Agronomy and/or Vet. Medicine	40.70 m^2	162
Economic Sciences	7.68 m^2	31
Average	25.01 m^2	100

[a]Calculated from: ERGO, Consultoria Econômica e Estatística (Soc. Civil), "Análise Econômica das Universidades Brasileiras" (unpublished study prepared for EPEA, Ministério do Planejamento e Coordenação Econômica (2 vols.; Rio de Janeiro: 1966).

rate of ten percent was used. This would be too high if all the investments were in buildings or land and too low if they were in short-life equipment. The maximum legal rate of interest in 1960 for general consumer and building loans (twelve percent per annum) was used to determine the foregone interest per student on the educational investment. A consensus of several persons interviewed indicates that this maximum legal rate was effectively the minimum rate as well and then only with inflation protection clauses in the loans. Hence, this rate was the market rate of "real" interest for this type of capital. Comparison of this interest rate for non-human capital is made with the various estimated internal rates of return to human capital--the subjects of this study. These comparisons are discussed in detail in Chapters IV and V. The two capital costs (Columns 10 and 12 of Table 2) added to the Social Costs without Capital previously determined give an estimate of Social Costs with Capital by educational specialty (see Table 4).

Evaluation of the cost figures is difficult. Direct Social Costs without Capital are derived from samples large enough that substantial reporting errors would be necessary to affect materially average results. Cost estimates prepared by several schools were obtained during interviews and each of these is in the same range as those calculated from the SEEC and ERGO reports. Costs of medical schools are probably overstated since their capital includes hospitals, and operating costs sometimes include hospital operation.

TABLE 4

INVESTMENT PER STUDENT BY FACULTY, 1960 CRUZEIROS, BRAZIL, 1960[a]

Faculty	Area Factor	Investment Per Student	Deprec./Stu. 10%	Interest/Stu. 12%	Deprec./Stu. Month	Interest/Stu. Month
Law	.26	189,214.	18,921.	22,706.	1,577.	1,892.
Engineering	1.30	946,072.	94,607.	113,529.	7,884.	9,461.
Pharmacy	1.16	844,188.	84,419.	101,303.	7,035.	8,442.
Philosophy	.62	451,204.	45,120.	54,144.	3,760.	4,512.
Medicine	2.18	1,586,491.	158,649.	190,379.	13,221.	15,865.
Dentistry	.98	713,193.	71,319.	85,583.	5,943.	7,132.
Agronomy	1.62	1,178,952.	117,895.	141,474.	9,825.	11,790.
Economic Sciences	.31	225,602.	22,560.	27,072.	1,880.	2,256.
Overall	1.00	727,748.	72,775.	87,330.	6,065.	7,278.

[a]Calculated from: ERGO, Consultoria Econômica e Estatística (Soc. Civil), "Análise Econômica das Universidades Brasileiras" (unpublished study prepared for EPEA, Ministério do Planejamento e Coordenação Econômica (2 vols.; Rio de Janeiro: 1966).

To the extent that these hospitals are used for training purposes, this reflects a valid educational expense. To the extent the hospitals provide non-educational services, both operating and capital costs are overstated. By calculating Social Rates of Return without capital costs, a maximum return (minimum cost) figure is obtained. The use of costs with estimates of the capital component provides an alternative figure based on the stated assumptions.

Both Private and Social Costs contain an imputed cost consisting of the income foregone by university students while in training. Table 5 contains the age-income distribution of university students in each of the areas studied. Foregone income is calculated by taking the average income of employed secondary graduates and subtracting the average income of the university student population in each of the relevant age groups. This net foregone income figure is used as a "cost" in determining Private Returns. The same figure is used to represent the value of product foregone by society in establishing total Social Cost. Conceptually, costs are considered as negative income as shown in the description of the models in Chapter II. This method of estimating foregone income assumes that the secondary graduates' incomes actually represent the alternative earnings of university students. This may not be the case. If the ability of university students is greater than that of the average secondary graduate, the calculated foregone income will be

TABLE 5

STUDENT AGE/EARNINGS

1 SEPT. 1959 - 31 AUGUST 1960

School Level Completed	Espírito Santo			North Region			Guanabara			Santa Catarina		
	Total Stud.	Average Age	Average Earnings/ Mo (Cr$)	Total Stud.	Average Age	Average Earnings/ Mo (Cr$)	Total Stud.	Average Age	Average Earnings/ Mo (Cr$)	Total Stud.	Average Age	Average Earnings/ Mo (Cr$)
2nd Ciclo Médio	206	22.10	4,561,	264	22.16	3,349,	754	22.4	4531	68	22.2	6157
1st Year University	64	22.98	5,651,	86	22.37	4,374,	634	23.3	4775	55	23.4	2900
2nd Year University	48	23.72	4,602,	67	23.84	5,587,	461	25.0	5823	45	26.1	3081
3rd Year University	35	24.09	5,371,	30	23.60	6,767,	282	26.0	7362	19	25.3	5263
4th Year University	14	(25.00)[a] 27.36	8,786,	25	25.92	8,090,	126	26.9	5970	11	26.3	10273
5th Year University	2	26.00	-	14	25.07	2,018,	-	-	-	-	-	-
T O T A L S	369			486			1438			143		

(a) Average if 38 and 45 yr. olds are not included

SOURCE: Brazil, Fundação IBGE, Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, Censo Demográphico de 1960.

understated. There are no studies in Brazil relating ability or intelligence to the level of schooling and therefore no correction for this potential error can be made. Further, if the family background of university students gives them a stronger economic position in the labor market, then the foregone income calculated is also understated. Again, no data are available that might permit adjustment or refinement reflecting this element.

No studies are available estimating direct private university costs to students and their families in Brazil. Public institutions, which enrolled over sixty percent of the students in higher education in 1960, generally did not charge tuition. Becker estimates that in 1939 in the United States private costs were divided as follows: foregone income, seventy-four percent; tuition and fees, seventeen percent; and other direct costs, nine percent.[12] "Other direct costs" plus "tuition and fees" then represented thirty-five percent of income foregone. Considering the reduced level of tuition payments, I would expect the figure for Brazil to be much lower. Carnoy's study of returns to education in Mexico uses a figure of eight percent of foregone income to represent the direct private cost to university students.[13] He bases

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[12]Gary S. Becker, Human Capital, A Theoretical and Empirical Analysis with Special Reference to Education (New York: National Bureau of Economic Research, 1964).

[13]Martin Carnoy, "The Cost and Return to Schooling in Mexico," (unpublished Ph.D. dissertation, Department of Economics, University of Chicago, 1964).

this figure on the relationships he found to exist between direct private costs and foregone income at the lower secondary school level. I have chosen an arbitrary figure of ten percent of net foregone income as the direct private cost for university students in this study. In Chapter IV, alternative figures are used to demonstrate the relative insensitivity of this figure.

Other Data Sources.--Mortality estimates used to obtain expected lifetime income utilize a life table prepared by the Instituto de Resseguros do Brasil for persons having an educational level equal to or exceeding secondary school. This institute is responsible for the preparation of the official actuarial tables used by Brazilian insurance companies. It is an estimate for the country as a whole and hence would be expected to vary from state to state, but this breakdown is not available. The institute did not feel that there were significant differences between life expectancies of persons completing the secondary and university levels. Table 6 contains the life expectancy calculations.

Income taxes paid by different income groups are calculated using data published by the Ministério da Fazenda for 1960. These data represent actual income tax payments rather than the statutory rates and are contained in Table 7. These after-tax income figures are used in determining Private Income as defined in Chapter I.

TABLE 6

MORTALITY CALCULATIONS

Age	Probability of Death Prev. Yr.	Probability of Death This Yr.	Probability Life Given 18 Years.
18	.00230	-	1.00000
19	.00237	.00007	.99993
20	.00243	.00006	.99987
21	.00251	.00008	.99979
22	.00259	.00008	.99971
23	.00268	.00009	.99962
24	.00277	.00009	.99953
25	.00288	.00011	.99942
26	.00299	.00011	.99931
27	.00311	.00012	.99919
28	.00325	.00014	.99905
29	.00340	.00015	.99890
30	.00356	.00016	.99874
31	.00373	.00017	.99857
32	.00392	.00019	.99838
33	.00412	.00020	.99818
34	.00435	.00023	.99795
35	.00459	.00024	.99771
36	.00486	.00027	.99744
37	.00515	.00029	.99715
38	.00546	.00031	.99684
39	.00591	.00035	.99643
40	.00618	.00037	.99612
41	.00659	.00041	.99571
42	.00603	.00044	.99527
43	.00751	.00048	.99479
44	.00804	.00053	.99426
45	.00861	.00057	.99369
46	.00923	.00062	.99307
47	.00991	.00068	.99239
48	.01064	.00073	.99166
49	.01145	.00081	.99085
50	.01232	.00087	.98998
51	.01327	.00095	.98903
52	.01430	.00103	.98800
53	.01543	.00113	.98687
54	.01665	.00122	.98565
55	.01798	.00133	.98432
56	.01943	.00145	.98287
57	.02100	.00157	.98130
58	.02271	.00171	.97959
59	.02457	.00186	.97773
60	.02659	.00202	.97571
61	.02878	.00219	.97352
62	.03118	.00240	.97111
63	.03376	.00258	.96854
64	.03658	.00282	.96572
65	.03964	.00306	.96266
70	.05930	.01966	.94300

SOURCE: Table prepared for Equipe de Assessoria ao Planejamento do Ensino Superior (EAPES) do Ministerio da Educação e Cultura by Instituto Resseguros Brasil for persons with high school or university education.

TABLE 7

INCOME REPORTED AND INCOME TAXES PAID, BRAZIL - 1960[a]

Income Tax Bracket Cr$x1,000/Yr.	Income Tax Bracket Cr$/Month	Taxes Paid (Cr$x1,000)	Number of Taxpayers	Average Tax/Yr.	Gross Income Cr$x1,000	Actual Tax Rate
91 - 135	7583-11,250	302,562	89,911	3,400	18,464,778	.016
136 - 180	11,251-15,000	429,239	71,794	5,900	18,282,400	.023
181 - 225	15,001-18,750	510,585	53,705	9,500	15,915,200	.032
226 - 300	18,751-25,000	857,661	52,803	16,200	19,116,572	.045
301 - 450	25,001-37,500	1,426,318	43,482	32,800	21,289,399	.067
451 - 600	37,501-50,000	1,108,670	18,690	59,300	12,261,723	.090
601 - 750	50,001-62,500	904,462	9,737	92,900	8,081,152	.112
751 - 900	62,501-75,000	718,870	5,462	131,600	5,374,900	.134
901 - 1050	75,001-87,500	621,468	3,485	178,300	4,381,599	.142
1051 - 1500	87,501-125,000	1,395,273	5,160	273,000	7,369,949	.189
1501 - 3000	125,001-250,000	1,896,684	3,293	576,000	7,408,513	.256
3001 - 4500	250,001-375,000	650,234	919	1,252,900	2,313,746	.281
Over 4500	Over 375,000	840,322	251	3,347,900	2,086,065	.403
TOTALS		11,658,348	358,242		142,285,996	

Income/Mo. Census Grouping	Midpoint	Income/Yr. Tax Brackets Cr$x1,000	Tax Paid Cr$x1,000	Taxpayers	Gross Earnings Cr$x1,000	Rate
6001	-	No tax	-	-	-	-0-
6001 - 10,000	8,000	91-135	302,562	89,911	18,404,778	.0164
10,000- 20,000	15,000	136-180 181-225	935,824	125,499	34,197,600	.0273
20,000- 50,000	35,000	226-300 301-450 451-600	3,392,649	114,975	52,667,694	.0644
50,000	110,000	Balance	7,027,313	27,857	37,015,924	.1898
TOTALS			11,658,348	358,242	142,285,996	

[a]Calculated from: Brazil, Ministério da Fazenda - Relatório das Atividades do Ano de 1960 (Rio de Janeiro: 1963).

CHAPTER IV

RESULTS

This chapter summarizes the results of the study by educational specialty and class of variable. Detailed statistical analyses by region and curriculum are contained in Appendix I. The calculations of rates of return are found in Appendix II.

Educational Specialty

Philosophy Graduates.--In each of the areas studied, graduates in Philosophy have the lowest average incomes of all university graduates, except in Espírito Santo, where the income of Pharmacy graduates is slightly lower. The general trends of the age-income profiles approximate those of the secondary graduates in each region. Reference to Figure 5 provides a comparison of the age-income profiles for this group in each of the four locations. Graphs for the separate areas are shown in Figures 21, 34, 46, and 58 in Appendix I, which contain the appropriate secondary graduate profiles as well. Peak incomes are reached in the Age 49 groups, except for persons in Santa Catarina, where they occur in the Age 59 group. Interview results in the respective states are consistent with the levels and general shapes of these profiles. In Guanabara and Santa Catarina, it was possible to obtain

COMPARATIVE AGE-INCOME PROFILES

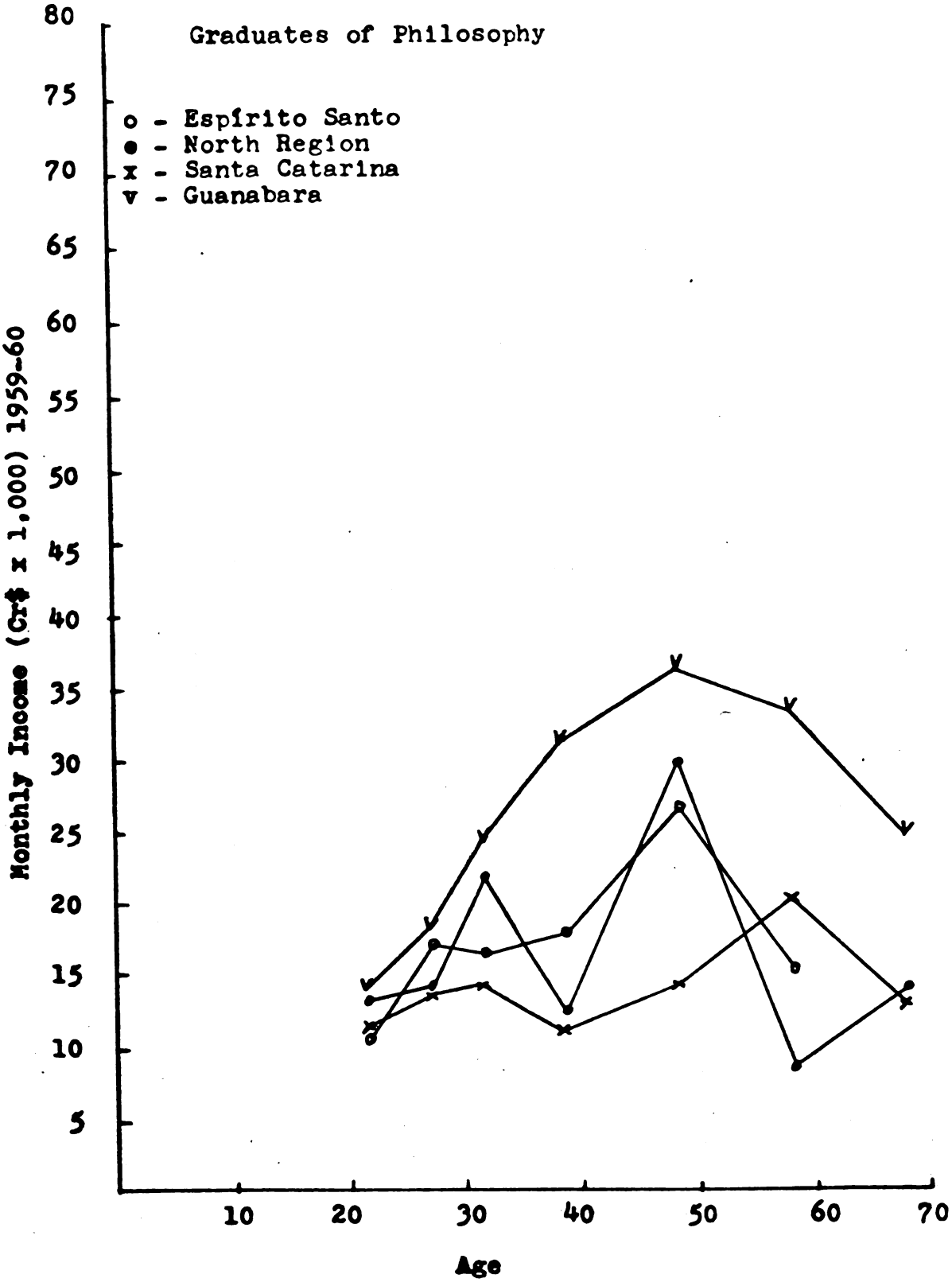


Fig. 5

the wage scales of secondary teachers prevailing in 1959-60 as set by the state governments for public schools. These scales are consistent with incomes reported in the Census. Wages paid by private schools were said to be lower than those paid by public institutions. The occupation of the graduates is not determined in the study, but over three fourths reported their primary Class of Activity as Social Services--the category that includes teaching. In Guanabara, 859 out of 1239 graduates in the sample are reported in Social Services. The geometric means of income in all other Classes of Activity reported are slightly higher than that of Social Services, although the levels of significance of the income differences are low. In the other areas, persons reporting Classes of Activity other than Social Services are too few in number to provide a dependable estimate of income opportunities for Philosophy graduates outside the teaching profession.

One of the few exceptions to the usual pattern of higher Male incomes compared to Female incomes is found among graduates of this curriculum. In both Espírito Santo and the North Region, women report higher average incomes than their male counterparts. In Guanabara and Santa Catarina, the opposite is true. Heads of Family earn more than Non-Heads of Family in all areas and, except in Espírito Santo, those with children have higher incomes than those without. Incomes of Protestants, Whites, and Jews are

generally higher than those of Roman Catholics, non-Whites and Other Religions. Public Employees and Employers or Self-Employed persons have higher incomes than do Private Employees. The relatively low level of earnings among non-government employees substantiates the private school wage lag mentioned above. There is no consistent trend in incomes between persons with different migration histories, but the normal pattern of higher urban incomes is apparent.

Rates of return to investment in the curriculum of Philosophy are negative in the North Region and Santa Catarina (see Table 15). In Espírito Santo, the private rate of 23.90 percent ranks sixth out of the nine curricula studied. The social rate without capital costs of 15.58 percent ranks fifth, and the social rate with estimated capital costs of 5.19 percent ranks sixth. In Guanabara, the private rate of only 7.28 percent ranks eighth in the state, while the two social rates of 6.50 and 4.02 percent both rank seventh. The relatively high rates of return in Espírito Santo almost exclusively are the result of the high earnings of this group relative to their secondary counterparts in the early earning years. This is an excellent example of the arithmetic of investment from which returns are received over the earning lifetime of the individual. Compound interest on such investments makes early earnings of much greater importance than those received later in life in determining the total rate of return.

There are several factors that contribute to the low rates of return and average income of this group. The costs detailed in Table 2 (Chapter II) show Philosophy to be the second cheapest curriculum offered (after Law) from the standpoint of explicit costs per student. The addition of capital costs changes its ranking to the third cheapest curriculum. Therefore, the basic problem is probably to be found in the level of earnings received by the group. In 1960, the largest university student population was found in Philosophy schools. The capacity of the educational system to produce teachers was large relative to many other courses, particularly those from which higher incomes could be expected. Entrance examinations for Philosophy are generally conceded to be less difficult and require less preparation than most other educational specialties. While there is certainly a large degree of administered wages set by state governments, there is no evidence from the data that Philosophy graduates moved away from teaching in substantial numbers because of low wages or any other reason. There is evidence that continued low relative wages do not attract as many students to Philosophy as is desired by most educators and planners. Furthermore, it is probable that the quality of students coming into the field is substantially lower than that going into Law, Medicine, and Engineering. Specialty courses taken by students in Philosophy tend to follow

classical lines.[1] Only recently has much attention been given to pedagogical training. Even today general information courses that might increase the flexibility of employment opportunities are rare. I do not expect this situation to change without a substantial increase in the wages of teachers relative to those of other university graduates.

Medicine Graduates.--The average earnings of graduates in Medicine rank consistently in the upper income groups. In Santa Catarina and the North Region, this group has the highest average income. In Espírito Santo, it ranks second after the very small sample (ten persons) of Economic and Political Science graduates. In Guanabara, it ranks fifth but remains among professions with relatively high earnings. Figure 6 shows the comparative profiles for Medicine in the several areas. Interviews tend to confirm both levels and shapes in all areas except Santa Catarina.

Unfortunately, it was necessary to interview in this state prior to having its data available or calculated. Questions regarding income levels and profile shapes were presented in terms of expected comparisons with the North Region and Espírito Santo, results for which were available at the time. The president of the Medical Association of Santa Catarina felt that the shape of the earnings profiles would be similar to those found in Espírito Santo and the

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[1]Specialties within Philosophy include Mathematics, History, Geography, Languages, and the Physical Sciences.

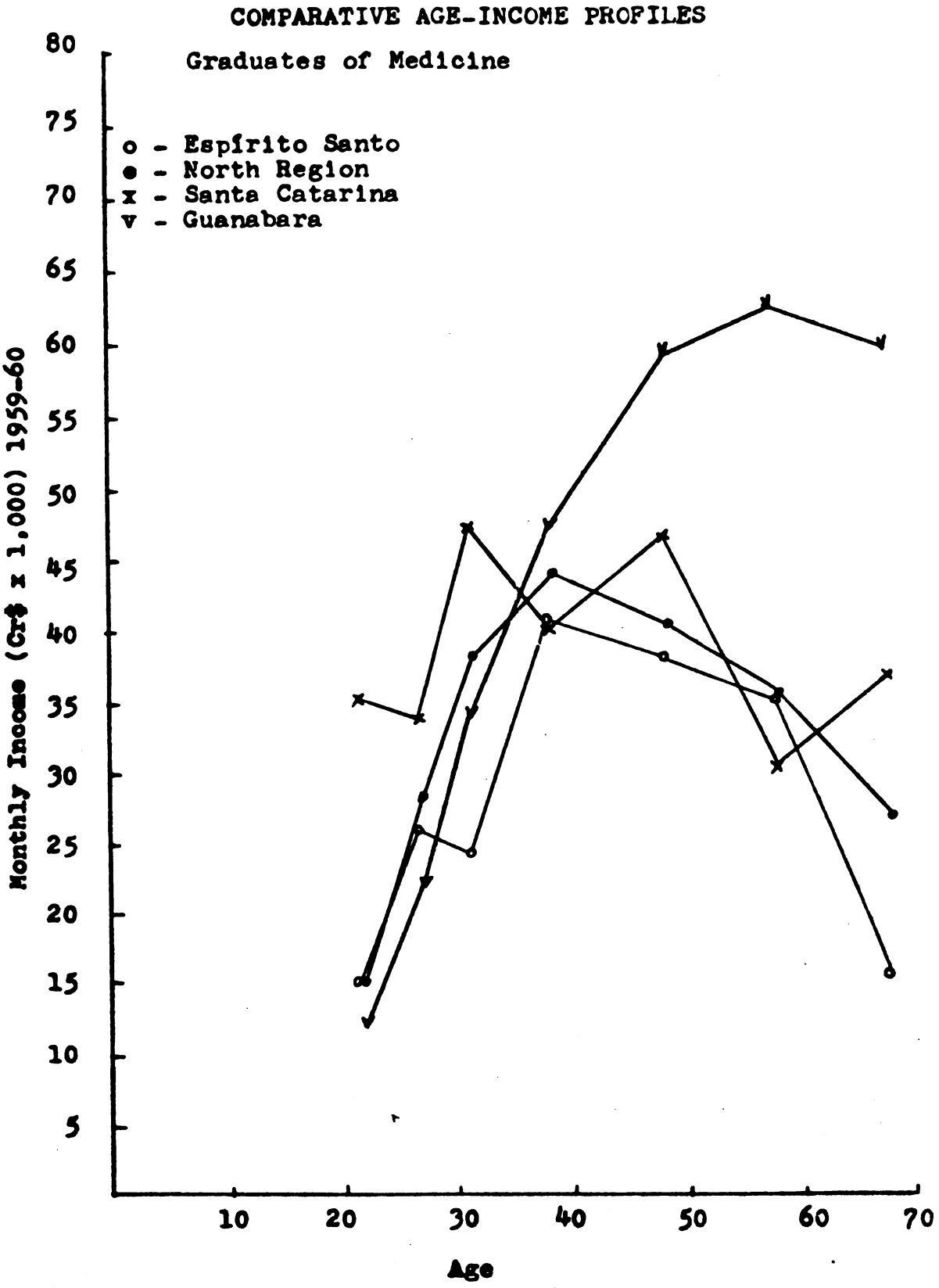

COMPARATIVE AGE-INCOME PROFILES
Graduates of Medicine
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1,000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 6

North Region, but that the level of earnings would be somewhat higher for Santa Catarina doctors. Average earnings are in fact greater in Santa Catarina than the other two areas.[2] The profile, however, is most irregular and does not exhibit the same characteristics of low early earnings and early retirement as do the other non-Guanabara areas. The only explanations I can suggest for the higher early earnings are two. The inhabitant/doctor ratio in Santa Catarina is higher than in any of the other areas, and this relative shortage of doctors may encourage higher beginning incomes.[3] Another possibility came out of the interview mentioned above. The opinion was expressed that earnings of doctors in the smaller urban centers would exceed those of the metropolitan centers due to "less competition" in the smaller towns. The regression results support this position by showing that the average income of suburban doctors is greater than that of urban residents. Typically, the non-urban doctor population consists of young people, and migration to the urban centers often follows the initial years of non-urban practice.

The income profiles for doctors in Espírito Santo and the North Region are very similar. Both start with an

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[2]Santa Catarina, Cr$40,231/mo.; Espírito Santo, Cr$32,498/mo.; and North Region, Cr$37,684/mo.

[3]Inhabitant/doctor ratio for the areas studied are: Guanabara 322, North Region 3809, Espírito Santo 3926 and Santa Catarina 5057.

initial wage of about twice their secondary graduate counterparts. The profiles then rise to a peak earning point within the group, Age 39. Beyond this point, reported (by assumption professional) incomes fall until the end of the earnings lifetime. While this phenomenon could be attributed to underreporting on the part of the older doctors, interview information suggests two alternative explanations. Working conditions for doctors outside the two main metropolitan centers of Rio de Janeiro and São Paulo are reputedly difficult. Support facilities such as hospitals and clinics are understaffed, overworked, or in many areas, non-existent. Working under these conditions, many doctors are physically unable to maintain a "full-time" practice beyond a relatively young age. A second factor involves both the background of many graduates in Medicine and their position in the community, once graduated. There are no reliable studies available concerning the family or economic background of the university graduates, and specifically Medicine graduates. Nevertheless, it is probably safe to say that a large portion of Medicine graduates comes from families whose economic, social, and/or political position puts them in a favorable position to obtain incomes not directly related to their university training. Similarly, prestige of doctors, particularly in smaller urban environments, opens doors to economic activities beyond the scope of their medical training. Hence, there exists a "push" factor caused by the nature of doctors'

work in these areas and a "pull" factor in the form of economic opportunities outside their profession. Both of these would stimulate the early reduction of professional income indicated in the profile.

The profile for Medicine graduates in Guanabara displays the same general form for earning years up to Age 39 as do the profiles for Espírito Santo and the North Region. In contrast, earnings beyond this age continue to rise until the Age 59 group, beyond which they decline slightly. The higher level of income is consistent with the higher levels of all secondary and university graduates' incomes in the state of Guanabara. The later retirement age, however, indicates an "area" difference within the profession which can be explained in several ways. Working conditions for the doctor in Guanabara are vastly superior to the general conditions found in other areas of Brazil (with the probable exception of São Paulo) thus encouraging professional practice of the older age groups. A great many more specialists are found in Rio than is the case in the other regions studied. The relatively high incomes of this group occur at older ages and tend to offset what might be lower earnings of general practitioners. As mentioned in Chapter III, the maximum Years of University reportable in the Census was six. Persons with more than six Years of University are included in the six-year category, hence, it is not possible to determine the degree of formal specialized training that might account for

increased earnings. Also, even though the density of doctors in the Guanabara area is over ten times (per capita of population) as great as in the other areas, the ability to support higher priced medical service (demand) is probably even greater. Finally, the greater availability of "educated" personnel in Rio probably reduces the alternative economic opportunities outside the medical profession which reduces the "pull" factor encountered in the other areas.

Among the variables studied, Sex yields the usual pattern of higher male earnings, except in Espírito Santo, where the two women reporting show higher incomes than their male counterparts. Santa Catarina had no women graduates in the sample. Heads of Family have higher incomes than Non-Heads of Family, and those with children have higher incomes than those without, except in Santa Catarina. The non-white samples are small in all cases, but Whites earn more than non-whites except in the North Region where non-whites (no Blacks were reported) earn more than Whites. Non-Roman Catholics earn more than Roman Catholics outside of Guanabara, but in Rio, "Other" religions report higher incomes than either Protestants or Jews. Even in the large population of Guanabara, no significant differences in income exist between the several Classes of Activity. The same is true in the other areas although, again, small populations limit significant results. A consistent trend exists within the Position variables with Employers or Self-Employed persons leading income followed by Private Employee and Public Employee. In

Espírito Santo, persons with no migration history earn more than those with either urban or rural histories of migration. The North Region provides an exceptional case in which earnings of persons with rural migration histories exceed those of their counterparts. In Guanabara and Santa Catarina, no significant differences occur within this variable class. While no significant income differences exist among the Environment variables, the trend is for higher earnings for urban residents followed by suburban and rural. The exception of Santa Catarina has already been discussed.

The private rates of return for graduates of Medicine are relatively high in all areas except Guanabara. There is a perfect correlation between the ranking of areas by inhabitants per doctor and private rate of return as follows:

Area	Rank	Inhabitants/ Doctor	Private Rate of Return
Santa Catarina	1	5057	27.16
Espírito Santo	2	3926	25.26
North Region	3	3809	21.47
Guanabara	4	322	13.21

This result is certainly consistent with expected results, given a competitive labor market for the specialty. It is also consistent with the often heard comment that doctors (and other professionals as well) would rather live in Rio even at the cost of lower earnings. Again, however, the influence of the age-income distribution on rates of return must be kept in mind. Figures 22, 35, 47, and 59, in Appendix I show the several age-income profiles of Medicine

graduates compared with their secondary graduate counterparts. At early earning ages--most important in determining rates of return--the Guanabara group has the lowest relative advantage. This is consistent with information from interviews which indicates that on-the-job training for young doctors (internship) is more intensive than that received in other areas. Although the income received in later life by the Guanabara group is larger relative to the secondary graduates, it is insufficient to offset the compounded deficit of the earlier years.

The divergence between private and social rates of return in medicine is the largest of all groups studied. The primary reason can be found in a review of the several costs involved. Private cost, within a given area and as calculated in this study, varies between curricula only with differences in time spent in the university during training. Hence, the difference in private cost between, say, a Law course and a Medicine course would be only the difference of one more year's expenses for the medical student. On the other hand, the social cost (total resources expended) of the two disciplines differs greatly on an annual basis. Reference to Table 2 in Chapter III shows that both with and without capital costs, the cost per medical student per unit time is over eight times that of a law student. The difference between social and private costs is paid by government (now, generally the federal government). Were income taxes sufficiently large, this governmental investment would be

recovered later in the form of increased income taxes. With the income tax collected in 1960, this clearly did not happen. Of interest, however, is the fact that in Guanabara, where money incomes were substantially above those received in other areas, the increase in taxes paid narrowed the divergence between social and private rates of return substantially.[4] The differences between private and social rates with capital costs are as follows for the four areas: Guanabara, 8.18 percent; North Region, 15.83 percent; Espírito Santo, 20.91 percent; and Santa Catarina, 20.43 percent.

Pharmacy.--The average income of Pharmacy graduates ranks eighth out of the nine educational specialties studied in all areas except Espírito Santo, where it ranked last. The comparative age-income profiles by area are presented in Figure 7 and the individual area profiles are shown in Figures 23, 36, 48, and 50 in Appendix I. There is no consistency in the profile shapes but the levels are all low relative to the respective secondary graduate counterparts as well as the profiles of most other university graduates. Among the interviews conducted pertinent to this group was

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[4]The age-income profiles indicate a substantially higher level of incomes to all groups studied, including the secondary graduates. The difference in the costs of living between Guanabara and the other areas was considerable except for Belem, Pará in the North Region. The cost of living indices for capital cities in the states covered for 1960 are as follows: Vitôria, Espírito Santo, 746; Belem, Pará, 1026; Pôrto Velho, Rondônia, 854; Rio Branco, Acre, 943; Manaus, Amazonas, 874; Boa Vista, Roraima, 919; Macapá, Amapá, 920; Rio de Janeiro, Guanabara, 1033; and Florianôpolis, Santa Catarina, 653. (Source: Brazil, IBGE Conselho Nacional de Estatística, Anuário Estatístico do Brasil - 1963) (Rio de Janeiro: 1964) p. 266. Index is calculated with Base 1948 = 100.

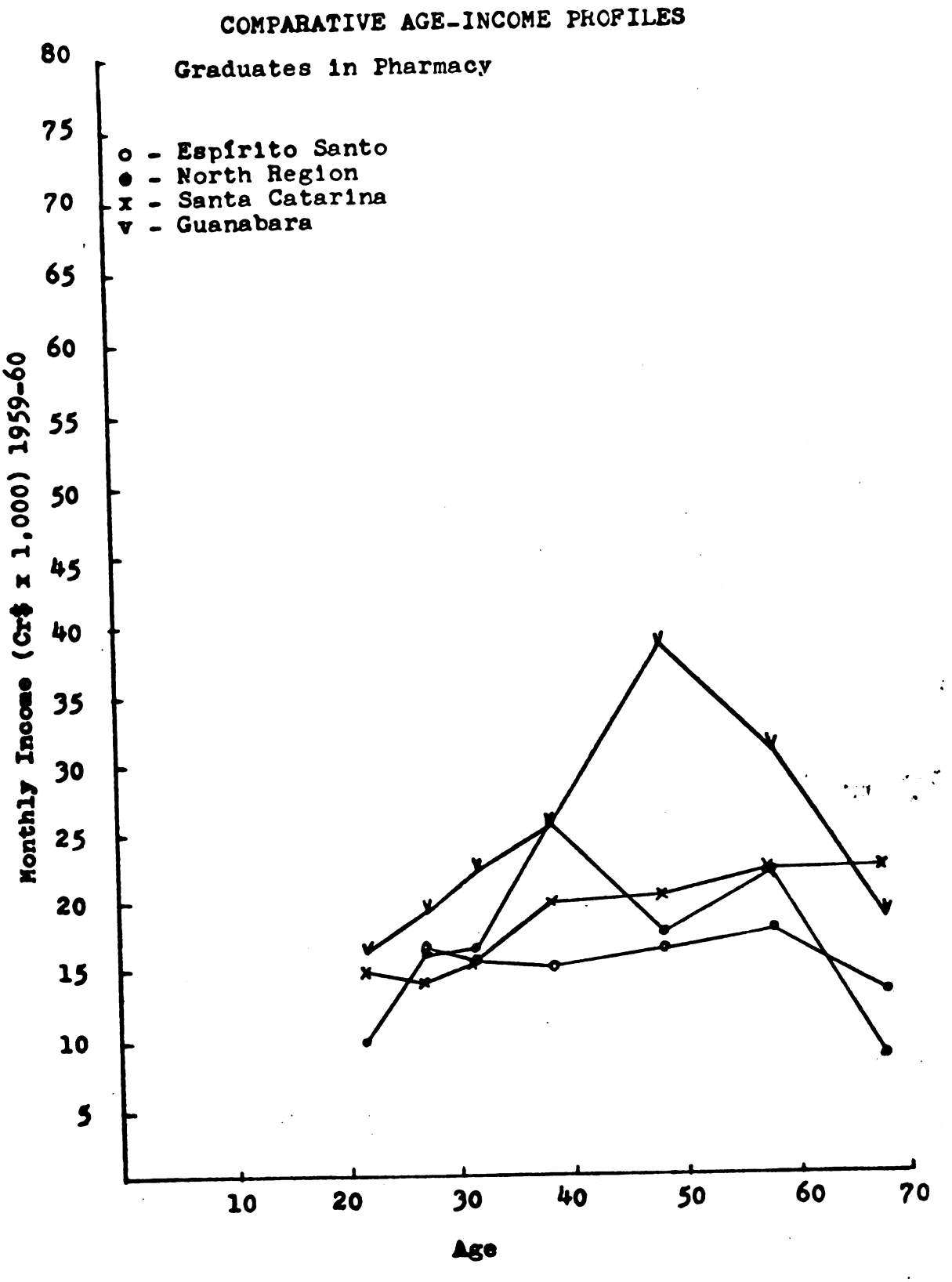

COMPARATIVE AGE-INCOME PROFILES
Graduates in Pharmacy
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1,000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 7

one with the Director, Faculdade de Farmácia, Universidade Federal do Rio de Janeiro. Neither the low levels nor the irregularities of the profiles surprised him. In his opinion, the highest quality graduates in the field almost invariably become employees of pharmaceutical firms, most of which are concentrated in São Paulo and the state of Rio de Janeiro. The second most desirable positions were found in government jobs at both the state and federal levels. At the lowest level were jobs as practicing retail pharmacists, either owning their own shops or as employees. The data support these opinions with the Public Employees reporting the highest incomes followed by Employers and Private Employees. An exception is found in the North Region where Employers have the highest earnings.

Sex, Head of Family, and Children variables show the normal pattern of higher earnings to Males, Heads of Family, and persons having children in Espírito Santo and the North Region. In Guanabara and Santa Catarina, the Head of Family and Children variables show opposite relationships although the income differences are very small. There is a trend toward higher earnings among non-Roman Catholics, especially in Guanabara where the differences are significant. There are no significant differences in incomes within the Class of Activities variables except in the North Region where all classes other than Government Service report less than Government Service. The trend among Migration variables ranks

From Urban first followed by No Migration and From Rural, and current environment variables show the typical pattern of highest income to urban residents followed by suburban and rural. Santa Catarina is an exception with suburban incomes exceeding urban.

In Espírito Santo and Guanabara, Pharmacy yields the lowest rates of return among all the curricula studied. In Espírito Santo and Santa Catarina, it was higher only than Philosophy. The per-student cost of the Pharmacy curriculum is high, exceeded only by Medicine and Agronomy. This cost is a major reason for the low returns, and even this relatively high level is probably understated. Interviews indicate that there are many students who enter Pharmacy as a second or third choice. Openings (vagas) in schools of Pharmacy are more available with less preparation than is the case for Medicine, or in some cases, Dentistry. During their first year or two of enrollment in Pharmacy, students continue studying for the entrance examinations for the other curricula and, if they pass and enter, they carry no credit for their completed work in Pharmacy. For example, credit for a basic chemistry course completed in the Pharmacy school would not be transferable to a Medical school even if the two courses were identical and the two schools were in the same university. This situation tends to overstate the number of students actually studying the Pharmacy course. Elimination of drop-outs and transfer students from the calculations would raise per-student costs. More detailed evaluation of

Pharmacy must await the calculations based on data from São Paulo and Rio de Janeiro (state) but the results to date indicate a problem area in terms of economic returns.

Dentistry.--The average incomes of graduates in Dentistry rank seventh out of the nine curricula studied in all areas, except the North Region, where they rank sixth. In general, the age-income profiles tend to parallel those of the secondary graduate groups in each region at a slightly higher level. Figure 8 shows the comparative profiles which, as with Pharmacy, show no consistent pattern except for their general low level. Interviews conducted in the several areas produced two unanimous opinions. In the first instance, all agreed that the profession of Dentistry has undergone a major change in terms of the university training necessary for practice. Most of the younger persons in the 1960 sample had completed a minimum of four years of university training. Many of the older group had been able to enter the profession after only a three-year course. Not only had the minimum number of years increased, but also the quality of the courses within the dental schools had been improved greatly since the 1930's. Most of those interviewed agreed that the profiles produced by the data were accurate but that the profiles of the younger members could be expected to develop much higher peaks than those of dentists over thirty years old in the sample. It was also mentioned, however, that professional earnings are expected to fall at a relatively

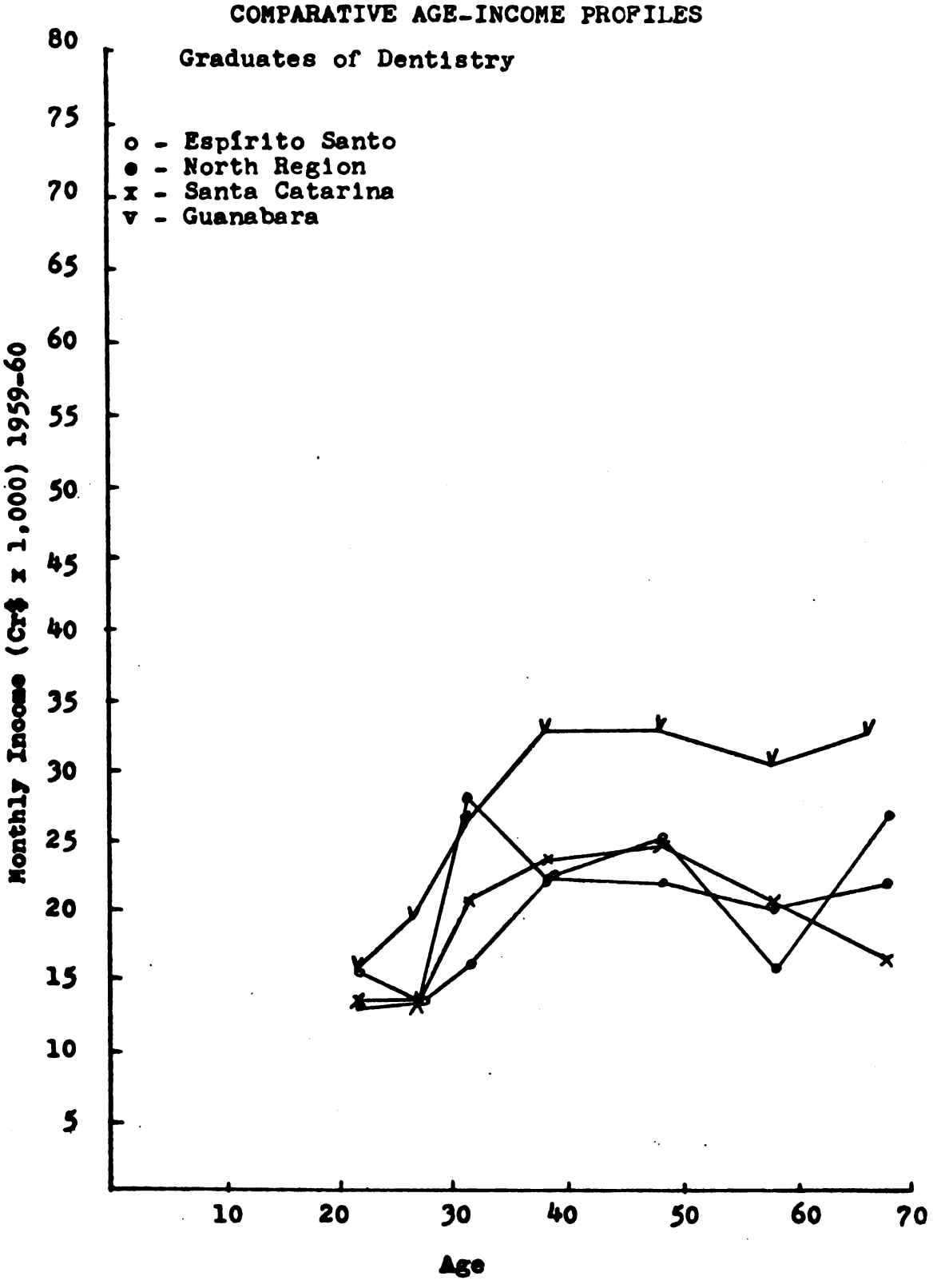

COMPARATIVE AGE-INCOME PROFILES
Graduates of Dentistry
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1,000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 8

early age due to the physical stamina and dexterity required of a practicing dentist.

All areas studied exhibit the normal trend of higher incomes to Males, Heads of Family, and persons with children when compared to their counterparts. Guanabara and Espírito Santo show higher incomes to Whites as compared to non-whites. The North Region has almost no difference between the groups, and Santa Catarina reports all Whites in the sample. Religion does not have any appreciable relationship to income differences. Within the Position variables, those persons who were Employers or Self-Employed have a consistent pattern of greater incomes than Private or Public Employees. The Classes of Activity of Liberal Professions and Social Services report incomes lower than the other classes indicating that at least some Dentistry graduates were able to find more renumerative activities outside their profession. Interviews support this view as well. Many dentists in all areas had completely abandoned their practice in favor of occupations unrelated to their university training. An urban migration history is generally associated with higher incomes than is the case for persons with no migration history or migration from a rural area, and urban residents have greater earnings than do suburban or rural dwellers. Santa Catarina again is an exception to the latter statement since suburban incomes exceed urban or rural in that state.

The private rate of return for investment in Dentistry ranks sixth out of the nine curricula studied in the North

Region, seventh in Guanabara and Santa Catarina, and eighth in Espírito Santo. Calculations of social costs, with and without capital, change the ranking only in Guanabara (from seventh to eighth). The divergence between private rates and social rates with capital ranges from six percent in Guanabara to almost fifteen percent in Espírito Santo. The social cost per student of a Dentistry curriculum is the median among the specialties studied, but the low reported incomes produce the relatively low rates of return. When compared to their secondary graduate counterparts, young dentists do have higher incomes than do graduates of many of the other educational specialties, and without this fact, the rates of return would be negative. It is of particular importance, however, to consider the opinions of those interviewed regarding the probable profile shifts described by the cross-section data when using these rates as predictive devices.

Engineering.--Among university graduates, those with degrees in Engineering have incomes that rank highest in Guanabara, second in Santa Catarina and the North Region, and third in Espírito Santo. The comparative age-income profiles in Figure 9 show a consistent pattern of incomes in all areas except Santa Catarina. This pattern is characterized by a very rapid increase in earnings to Age 32 or Age 39 followed by relatively level earnings at the high levels until normal retirement after Age 59. During this time, Brazil was in a

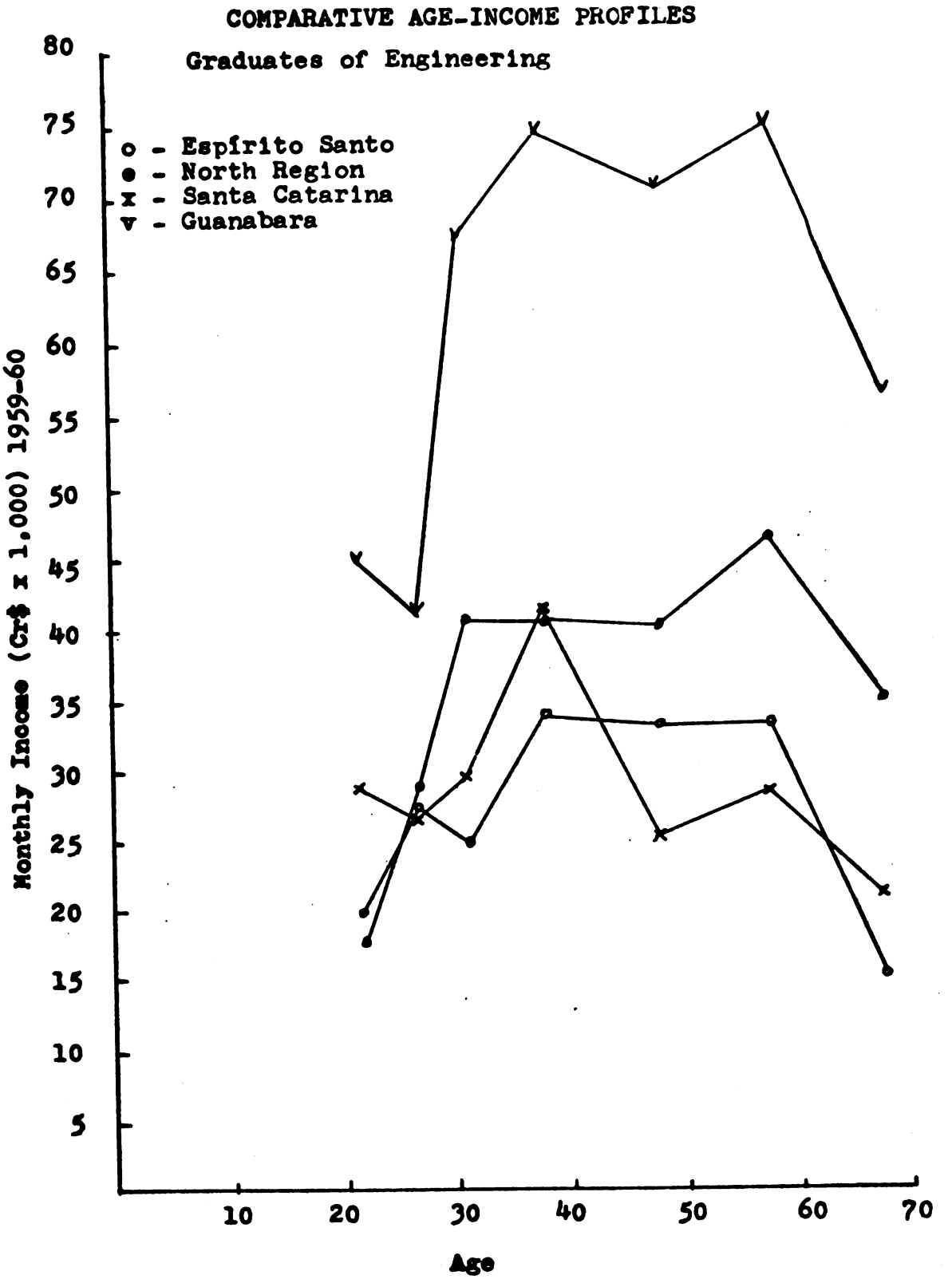

COMPARATIVE AGE-INCOME PROFILES
Graduates of Engineering
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1,000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 9

period of rapid industrialization which created a substantial demand for engineers, particularly when compared to other university graduates. The rapid rise of incomes in the early earning years reflects both this demand plus the ability to apply their education to productive efforts with relatively small amounts of general on-the-job training. Interviews in all areas support the levels and shapes of the profiles obtained from the data. In Santa Catarina, the lower incomes of the older group were explained by the fact that in 1960, a large proportion of older engineers was employed by the state government which, at the time, was paying wages below the market in the private sector. These opinions were supported by the regressions of Class of Activity variables. The job security and fringe benefits of government employment reduce, or at least slow down, emigration from the sector into higher paying jobs in the private sector.

In Espírito Santo, Santa Catarina, and Guanabara, the Male, Head of Family and Has Children variables show the normal relationship of higher incomes than their counterparts. In the North Region, the two female engineers in the sample show much higher incomes than their male colleagues, and persons without children report higher incomes than those with. A consistent pattern of higher incomes for Whites compared to non-whites is exhibited in all regions except Santa Catarina where no non-white engineers are reported. In Guanabara and Espírito Santo, non-Roman Catholic earnings are greater than those of Roman Catholics but there is no clear

trend in the other two areas concerning Religion. Within the Class of Activity variables, there is a trend toward higher earnings in Manufacturing and Extractive Industries and lower incomes in Services Industries. Ranking of incomes by Position in Guanabara places Employers first, Private Employees second, and Public Employees third. In the other areas there is a trend of relatively higher incomes among Public Employees reflecting the increased role of government in the engineers' labor markets. Graduates with a history of migration from an urban area or with no migration history earn more than those migrating from rural areas for all regions studied, and persons living in urban or suburban environments generally have greater incomes than those living in rural areas.

The rates of return to investment in an engineering education are among the highest found in this study. Private rates of return range from 22.70 percent in Guanabara to 28.06 percent in Espírito Santo. Within the areas these returns rank highest in Guanabara, second in the North Region, third in Espírito Santo, and fourth in Santa Catarina. Social returns including capital costs range from 8.14 percent to 14.27 percent--comparatively large divergences. The ranking of social returns with capital costs within the regions changes the order to the following: Guanabara, second; Espírito Santo and Santa Catarina, third; and the North Region fourth. The smaller divergence within Guanabara again reflects the influence of income taxes on the higher money income levels in the state.

Law.--Average earnings of Law graduates are comparatively high in most regions. Ranking incomes with graduates of other university courses within each area produces the following standings: Guanabara, second, Santa Catarina, third; the North Region, fourth; and Espírito Santo, fifth. As is often the case, however, these general income averages obscure some very interesting characteristics. Comparison of age-income profiles (Figure 10) shows a pattern of high early earnings compared to secondary graduate counterparts followed by a trend toward increased earnings to the end of the working lifetime. Interviews indicate several reasons for this trend, the most important being that a much higher portion of the activities engaged in by Law graduates is considered by them to be related to their primary occupation and training, and hence, would be reported. A review of the course content offered by Law schools shows that a lawyer's training is in fact a general course in the social sciences, humanities, and business administration with a comparatively small portion devoted to the kind of legal training common in the United States. The ramifications of this are discussed below in connection with the rates of return and again in Chapter V regarding educational investment policy.

Males, Heads of Family, and persons with children earn higher incomes than their counterparts, except in the North Region, where those without children have earnings larger than those with children.

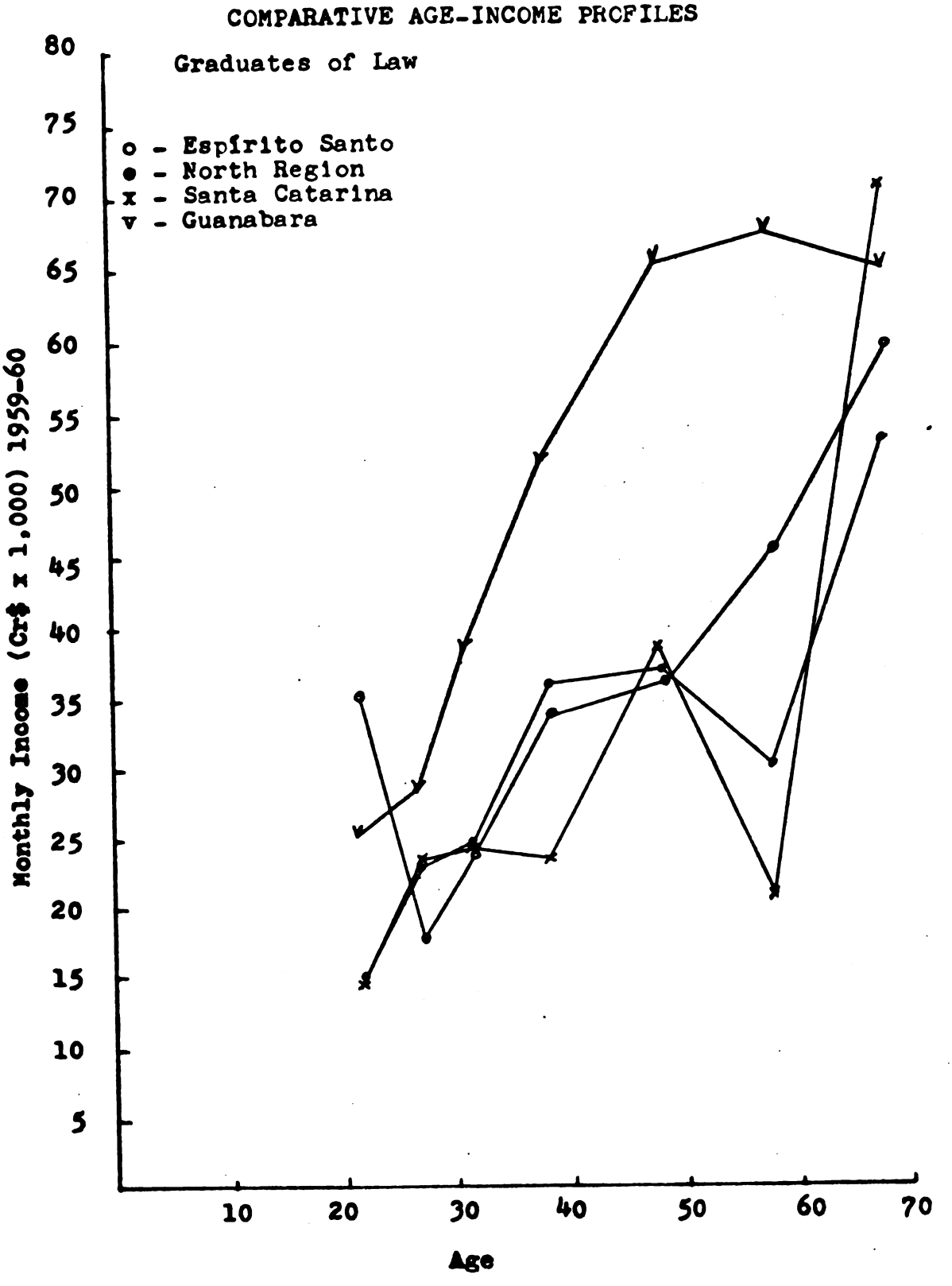

COMPARATIVE AGE-INCOME PROFILES
Graduates of Law
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1,000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 10

Religion does not affect income to any large extent although there is a trend for larger incomes among Protestants in Guanabara and Espírito Santo while earnings of Roman Catholics rank higher in Santa Catarina and the North Region. Whites earn more than non-whites in Guanabara and Espírito Santo. The converse is true to a small degree in the North Region, and Santa Catarina reports an all white sample of Law graduates. Within the Class of Activity variables, it is interesting to note the relatively broad distribution of lawyers among the several classes with higher levels of income in all categories compared to liberal professions. This supports the hypothesis that the Law curriculum does prepare graduates for productive work outside the narrow field of "law."

Employers earn more than Private Employees who, in turn, earn more than Public Employees, except in Santa Catarina, where the order is reversed. Migration history has little influence on incomes except there is a trend toward lower incomes for persons having migrated from rural areas. In all areas except Espírito Santo, urban incomes exceed non-urban incomes.

Private rates of return rank in the middle of the educational specialties studied--fourth in the North Region and Guanabara; and fifth in Santa Catarina and Espírito Santo. Social rates with capital, however, rank much higher--first in the North Region and Santa Catarina; second in Espírito Santo; and third in Guanabara. Divergences are the lowest of

any curriculum studied ranging from 2.07 percent in Guanabara to 7.50 percent in Espírito Santo. When capital costs were eliminated from the social return calculation, a rate greater than the private rate resulted for Guanabara (16.75 percent versus 15.90 percent).

The total per-student cost of a Law education is by far the lowest among those studied. Part of this can be explained by the relatively cheap physical plant required (no laboratories, etc.) but an even more important explanation is found in the high enrollments and high utilization of facilities in most of the Law schools in the country. This low cost plus an output that is able to be productively employed in a variety of economic endeavors produce comparatively good returns to private investment as well as the investment by society.

Agronomy.--The average income of Agronomy graduates ranks fourth in Espírito Santo, fifth in Santa Catarina, sixth in Guanabara, and seventh in the North Region. The comparative profiles shown in Figure 11 do not display any significant interregional pattern of lifetime earnings except that older agronomists in all areas outside of Guanabara report comparatively low incomes. Guanabara shows an interesting contrast in the high level of incomes exhibited for older members of the profession. An interview with the Presidente, Sociedade Brasileira de Agronomia introduced a probable cause for these results. Most young agronomists commence their careers in agricultural areas outside of

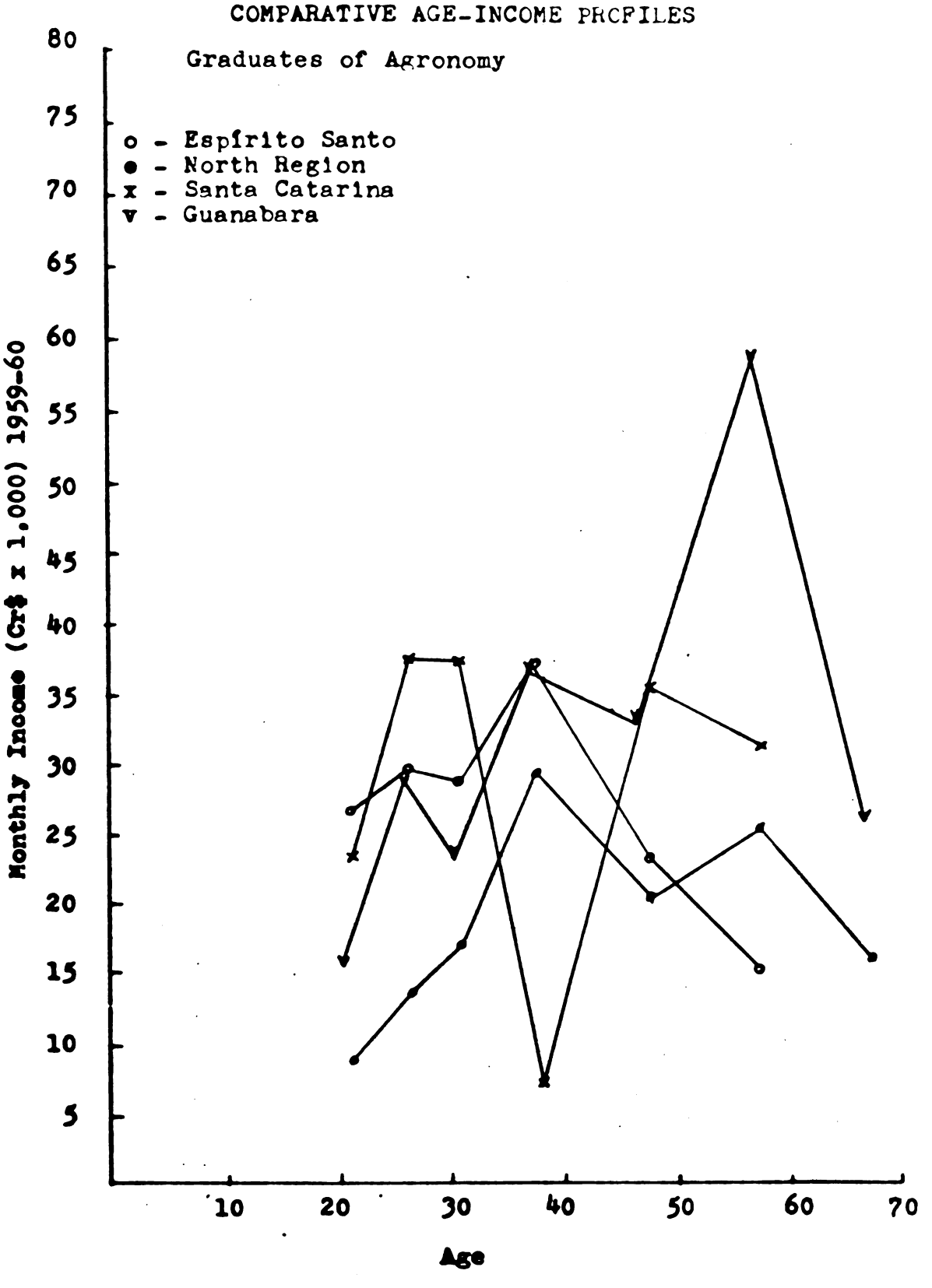

COMPARATIVE AGE-INCOME PROFILES
Graduates of Agronomy
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1,000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 11

Guanabara. Recently they have been able to do well compared to their secondary graduate counterparts, particularly in areas where modern agriculture is developing. Such is the case in Santa Catarina and Espírito Santo, but less so in the North Region where traditional agriculture still holds sway. For older agronomists, better job opportunities exist in greater quantity within the federal government (in Guanabara) and hence, the marked difference in earnings existent among the older group in Guanabara compared to the other areas. Combined with this situation is another clear-cut example of shifts in the quality of education received by agronomists in the sample. Prior to World War II, the course in Agronomy was little more than a vocational training course at the university level. Since that time, it has developed in most universities into a scientifically based curriculum of considerably more value to the developing modern agricultural sector.

Because of the small populations in areas outside Guanabara, the significance of the variables studied is very low. The trends, particularly in the larger population found in Guanabara, are typical in that Males, Heads of Family, those with children, and Whites earn more than their counterparts. Among Classes of Activity, Government ranks high in Guanabara but comparatively low in the other areas.

The rates of return show extreme variance between regions, both in their ranking within the region and their

absolute values. Private rates and internal ranking of these rates are as follows:

Santa Catarina	40.63 percent	(first)
Espírito Santo	35.86 percent	(second)
Guanabara	15.18 percent	(fifth)
North Region	11.76 percent	(seventh)

Without allowance for capital costs, the annual cost per student of the Agronomy curriculum is the highest of those studied. Addition of capital costs changes its rank to second (after Medicine). These relatively high costs contribute to a substantially lower ranking of social rates within the several areas--fourth in Espírito Santo, fifth in Santa Catarina, sixth in Guanabara, and seventh in the North Region. The resulting divergences range from a low of 10.29 percent in Guanabara to a high of 33.89 percent in Santa Catarina (the highest divergence encountered in the study). It is difficult to define or measure "modern" as opposed to traditional agriculture in an aggregate sense for any given area or region. Nevertheless, there is little doubt that Santa Catarina and Espírito Santo would rank higher in "modern" production than the North Region. The labor market for agronomists clearly reflects the difference in demand resulting at least partially from differences in production techniques.

Economic and Political Sciences.--While the Census classification for this category includes both Economic and Political Sciences, for all intents and purposes the category

represents graduates of the curriculum "Ciencias Econômicas" as earlier described in Chapter III. While no detailed breakdown is available separating the two curricula, all interviews indicate that the number of political science majors is almost negligible and their inclusion does not bias results significantly from those of graduates in Economic Sciences.

Ranking the average incomes of these graduates within each area produces the following results: Espírito Santo, first; Guanabara, third; North Region, fifth; and Santa Catarina, sixth. Very small populations are encountered in all areas except Guanabara. This undoubtedly contributes to the irregular profiles shown in Figure 12. With the exception of the North Region, early earnings relative to secondary graduate counterparts are high. In all samples, the age distribution of this group is skewed considerably toward the younger ages reflecting the fact that Economic Sciences as a separate curriculum is a relatively new development in Brazilian higher education. Interviews indicate that the market for graduate economists in Brazil was just beginning to develop in 1960, and the high earnings of the younger graduates reflects this development. Since 1960, demand for this specialty has increased considerably which means a high probability of greater expected earnings in older age groups than is exhibited by the 1960 cross-section profiles. This situation is comparable to the profile shifts produced by changing educational quality that have already been discussed.

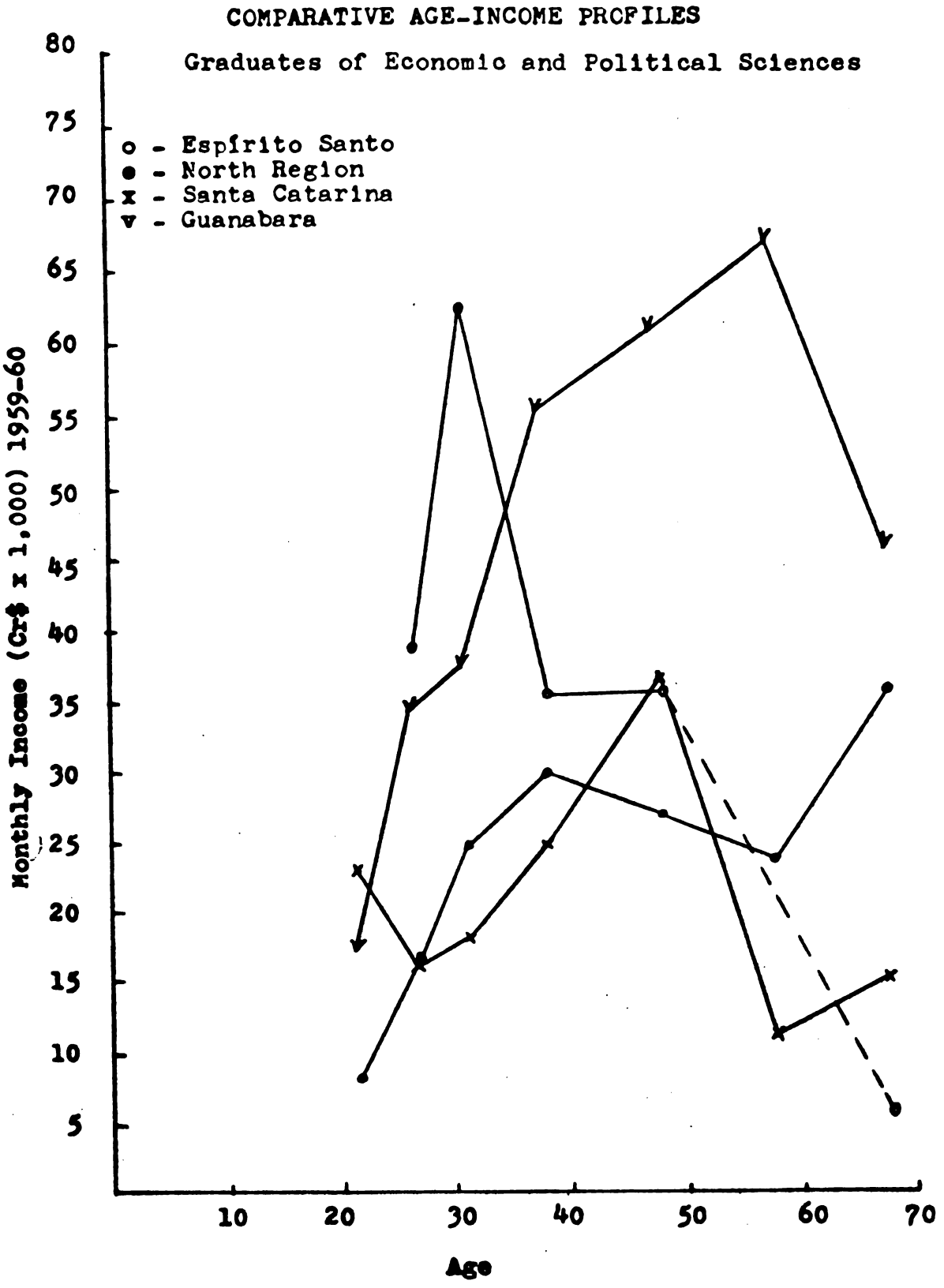

COMPARATIVE AGE-INCOME PROFILES
Graduates of Economic and Political Sciences
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1,000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 12

In Guanabara, the sample population is sufficiently large to obtain significant results from regressions of all the variables used in the study. In this case, the usual pattern of income differentials is found within the Sex, Head of Family, and children classes. Males, Heads of Family, and persons with children report incomes higher than their counterparts. Whites earn more than non-whites, and Protestants have higher earnings than Roman Catholics. Government connected employment is the best Class of Activity but only when working for the government as an independent employee or employer (not directly on the government payroll). Persons with a history of migration from an urban area earn more than persons with no migration history who, in turn, earn more than those that have migrated from rural regions. Finally, urban dwellers have higher incomes than suburban or rural residents.

Private rates of return to investment in Economic Sciences rank comparatively high in Espírito Santo and Guanabara (first and second respectively) and relatively low in the North Region and Santa Catarina (fifth and sixth respectively). Social rates with capital rank internally as follows: Guanabara and Espírito Santo, first; Santa Catarina, second; and the North Region, third. Divergences between private and social rates are comparatively low, ranging from 3.49 percent in Guanabara to 13.85 percent in Espírito Santo. The per-student cost of this curriculum is second

lowest among those studied. This contributes to the high rates of return and low divergences. As with Law, the general business training received in this course results in flexibility in performing various classes of productive work. This is confirmed by the wide distribution found within the samples between the several Classes of Activity.

Other Courses Completed.--The composition of this group varies from region to region, but in all cases a substantial proportion consists of graduates of military schools at the university level. The balance of the group is made up of graduates of Fine Arts, Veterinary Medicine, Architecture, etc. as shown by the Sample Composition Tables in Appendix I. The comparative age-income profiles in Figure 13 show little consistency in shape or levels which may be due to the different makeup of the samples in the various areas. In Guanabara, over two-thirds of this population consists of military graduates and the profile in this case is very similar to that of the Law graduates in the state. This reflects the fact that many relatively well-paid positions are obtained by persons with a background of military service or training. Whether the education received by the group is directly responsible, or whether this is a function of social and political position is difficult to determine. Early earnings are high in comparison to secondary graduates in all areas except Santa Catarina.

Private rates of return to educational investment in these "Other Courses" rank relatively high in the several

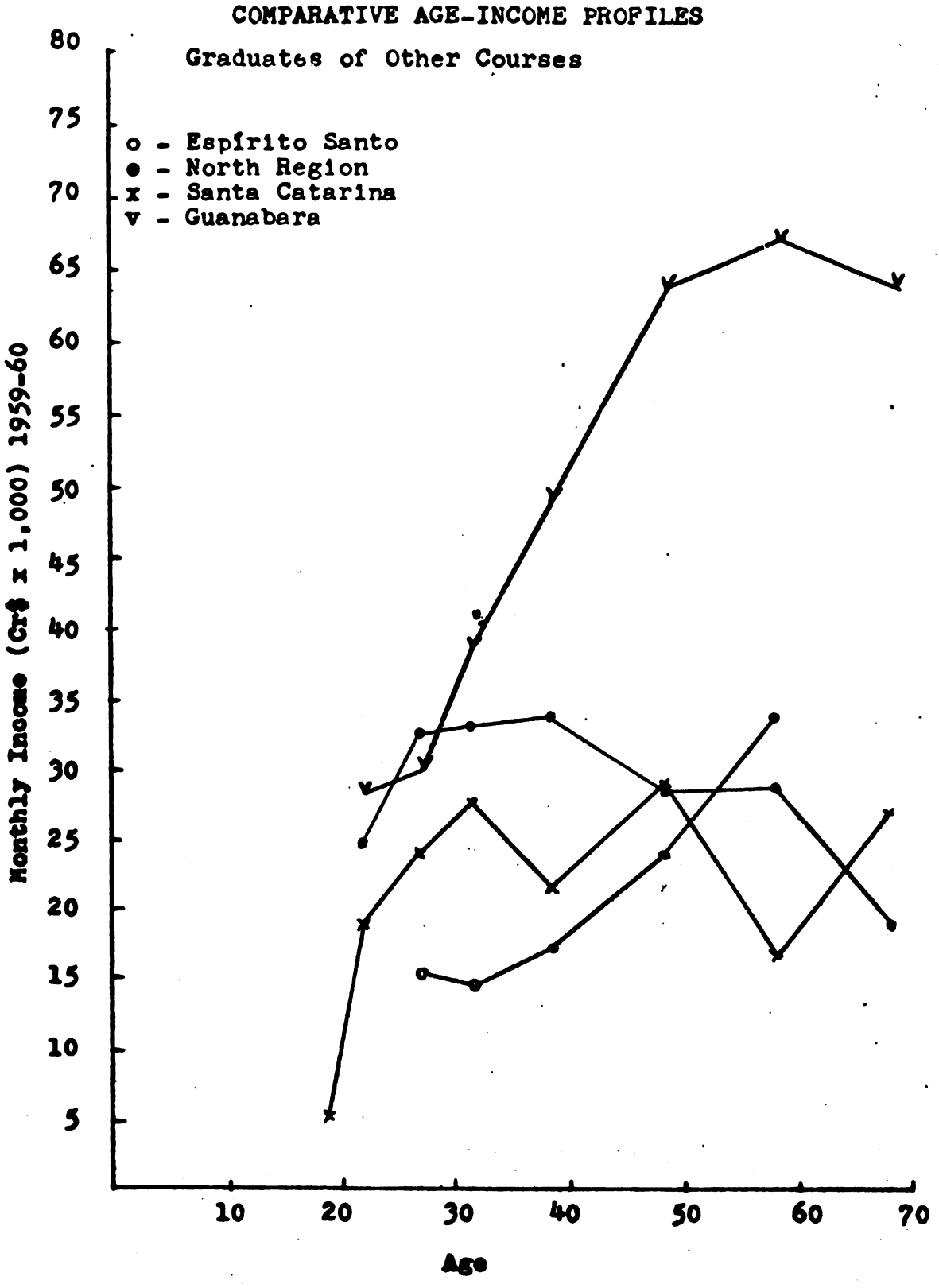

COMPARATIVE AGE-INCOME PROFILES
Graduates of Other Courses
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1.000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 13

regions--in Guanabara and Santa Catarina, third; in the North Region, first; and Espírito Santo, seventh. Social rates rank second in the North Region, fourth in Guanabara and Santa Catarina, and fifth in Espírito Santo. It is possible that this may be a result of general training making possible a wide range of job opportunities. Support of this position would require more detailed analysis of both the sample compositions and the different curricula involved.

Years of University Completed.--There is a general tendency toward increased earnings by persons completing additional years of university. The number of exceptions to this trend, however, make it impossible to state that each additional year of university completed is consistent with higher incomes. Among university graduates, those with five or six years completed have higher earnings than those with three or four years. Among drop-outs (secondary graduates with some university training but without a degree), earnings are generally higher than among their secondary counterparts without any college experience.

Private rate of return calculations were performed for the several Years of University Completed samples in the North Region, Espírito Santo, and Santa Catarina. University Graduates received a higher return to their educational investment than did non-graduates, and graduates with five and six years received more than those with three and four.

All University Graduates.--All of the sub-samples described above were aggregated into a sample of All University

Graduates for each region studied. Figure 14 shows the comparative age-income profiles of these samples for the several areas. The Guanabara profile reflects not only the comparatively high money incomes found in that state but also the relatively late retirement age. The other three areas have profiles displaying close similarity. Earnings in young age groups in the North Region are higher than those in Espírito Santo and Santa Catarina, but a decrease in professional incomes occurs at an earlier age (Age 39 as compared to Age 49). The most probable reason for the difference in retirement ages between Guanabara and the other regions is the relatively larger number of income opportunities existing in these regions not directly related to professional training. This trend has been discussed in relation to many of the sub-samples, and the aggregate age-income profile reflects it.

Within all areas, Males earn more than Females, Heads of Family more than non-heads of family, and those with children more than those without.[5] In Guanabara and the North Region, Protestants have higher incomes than Roman Catholics, In Espírito Santo, the earnings of the two groups are nearly the same, and in Santa Catarina, Roman Catholic incomes exceed those of the Protestants. Whites consistently report higher incomes than the averages of non-whites. There

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[5] In the North Region, persons without children earned slightly more than those with children.

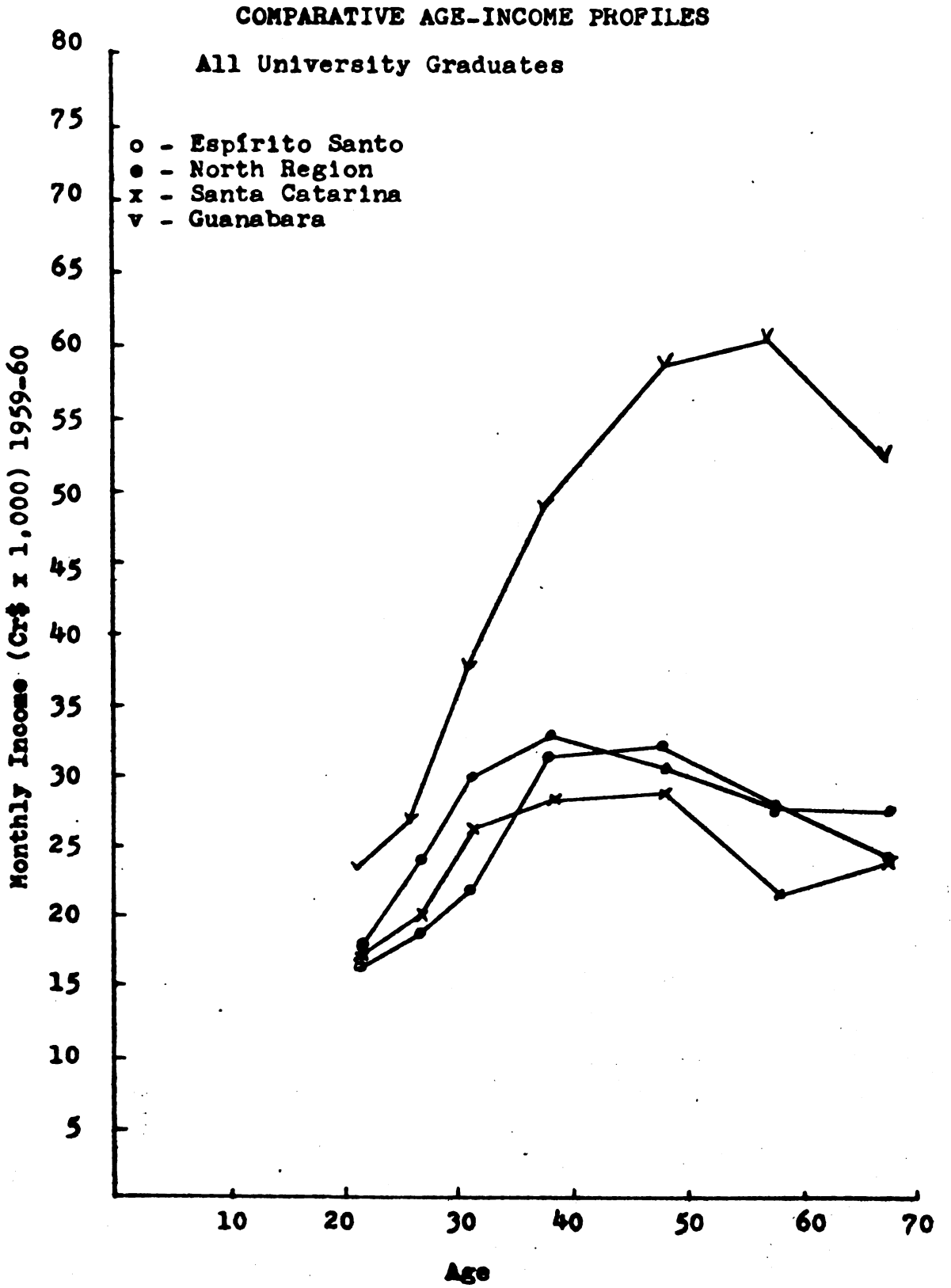

COMPARATIVE AGE-INCOME PROFILES
All University Graduates
o - Espírito Santo
● - North Region
x - Santa Catarina
v - Guanabara
Monthly Income (Cr$ x 1,000) 1959-60
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
Age

Fig. 14

is little consistency of earning differentials among the Class of Activity variables between the areas nor does this group of variables explain much of total income variance.[6] Within Activity, earnings differentials are generally small in all areas, except Guanabara, where earnings of the top three classes (Manufacturing Industry, Extractive Industry, and Agriculture) were approximately double those of the lowest class (Social Services).

When income is ranked by the Position variables, the following order results: Employers and Self-Employed persons, first; Private Employees, second; and Public Employees, third. An exception to this ranking is found in the North Region and in Santa Catarina where Public Employees' incomes rank highest. Ranking of income by Migration variables shows a strong trend toward higher incomes among those having migrated from an urban area followed by incomes of persons with no migration history. Persons having migrated from a rural area report the lowest incomes of this variable class. There is total consistency in the ranking of incomes by Environment--Urban followed by Suburban with Rural reporting the lowest earnings.

Private rates of return and social rates of return with capital for each region are as follows: Espírito Santo, 24.95 percent and 8.22 percent respectively; Santa Catarina, 21.88 percent and 7.52 percent; the North Region, 20.73

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[6] In regressions of Class of Activity variables on log income, the following $\bar{R}^2$ results: Guanabara, .046; Espírito Santo, .013, Santa Catarina, .039; and the North Region, .059.

percent and 10.23 percent; and Guanabara, 16.74 percent and 10.23 percent. As is the case for all of the sub-samples, divergences in Guanabara are much lower than in any other area reflecting the influence of the income tax structure on the higher money incomes in the state.

Sensitivity of Results

Chapter III points out that lack of data on the cost of university training to the individual and/or his family (explicit cost) makes it necessary to estimate this figure. To check the sensitivity of private rates of return that use this estimate, alternate calculations were made for the North Region using different estimates of explicit private university cost. The original estimate was halved, doubled, and trebled, and the resulting rates of return compared. Tables 8, 9, 10, and 11 show the calculations and their respective rates. The cost estimate used in the study (ten percent of net foregone income) yields a rate of 20.73 percent. Halving the cost increases the rate only to 20.99 percent; doubling the cost decreases the rate to 20.22 percent; and trebling the cost reduces the rate to 19.73 percent. The reason for this limited influence is the relatively large importance of foregone income in calculating costs of university training to the individual.

Similarly, alternative tax rates were introduced into the private rate of return calculations for the same subsample. The effective tax rate was more than doubled as

TABLE 8

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	---	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
25	---	---	---	10,454	6,177	428	.99919	18	-(84.62)	44
27	23,513	.0644	21,999	10,454	---	---	.99919	42	484.49	42
32	29,317	.0644	27,429	13,040	---	---	.99838	60	861.94	37
39	32,384	.0644	30,298	16,309	---	---	.99643	120	1,672.74	30
49	29,976	.0644	28,046	18,263	---	---	.99085	120	1,163.16	20
59	27,364	.0644	29,602	17,823	---	---	.97773	120	912.66	10
68	27,354	.0644	25,592	16,879	---	---	.94954	72	595.71	1

Private Rate of Return: (1) 20.7309

TABLE 9

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ALL UNIVERSITY GRADUATES
DIRECT UNIVERSITY COSTS HALVED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Months in Period	Flow Per Period Cr$x1,000	Yrs.to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	198	.99971	36	-(149.76)	46
25	---	---	---	10,454	6,177	214	.99919	18	-(80.77)	44
27	23,513	.0644	21,999	10,454	---	---	.99919	42	484.49	42
32	29,317	.0644	27,429	13,040	---	---	.99838	60	861.94	37
39	32,384	.0644	30,298	16,309	---	---	.99643	120	1,672.74	30
49	29,976	.0644	28,046	18,263	---	---	.99085	120	1,163.16	20
59	27,364	.0644	29,602	17,823	---	---	.97773	120	912.66	10
68	27,354	.0644	25,592	16,879	---	---	.94954	72	595.71	1

Private Rate of Return: 20.9930

TABLE 10

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ALL UNIVERSITY GRADUATES
DIRECT UNIVERSITY COSTS DOUBLED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Months in Period	Flow Per Period Cr$x1,000	Yrs.to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	792	.99971	36	-(171.17)	46
25	---	---	---	10,454	6,177	856	.99919	18	-(92.32)	44
27	23,513	.0644	21,999	10,454	---	---	.99919	42	484.49	42
32	29,317	.0644	27,429	13,040	---	---	.99838	60	861.94	37
39	32,384	.0644	30,298	16,309	---	---	.99643	120	1,672.74	30
49	29,976	.0644	28,298	18,263	---	---	.99085	120	1,163.16	20
59	27,364	.0644	29,602	17,823	---	---	.97773	120	912.66	10
68	27,354	.0644	25,592	16,879	---	---	.94954	72	595.71	1

Private Rate of Return: 20.2229

TABLE 11

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ALL UNIVERSITY GRADUATES
DIRECT UNIVERSITY COSTS TRIPLED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Months in Period	Flow Per Period Cr$x1,000	Yrs.to End
19	---	---	---	5,573	3,350	----	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	----	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	1,188	.99971	36	-(185.42)	46
25	---	---	---	10,454	6,177	1,284	.99919	18	-(100.02)	44
27	23,513	.0644	21,999	10,454	---	----	.99919	42	484.49	42
32	29,317	.0644	27,429	13,040	---	----	.99838	60	861.94	37
39	32,384	.0644	30,298	16,309	---	----	.99643	120	1,672.74	30
49	29,976	.0644	28,046	18,263	---	----	.99085	120	1,163.16	20
59	27,364	.0644	29,602	17,823	---	----	.97773	120	912.66	10
68	27,354	.0644	25,592	16,879	---	----	.94954	72	595.71	1

Private Rate of Return: 19.7348

shown by a comparison of Table 8 and Table 12. The private rate of return was only reduced .73 percent by this operation. If the sample of All University Graduates in Guanabara had been chosen, the influence would have been greater due to the higher level of earnings in that state. Nevertheless, substantial changes would be needed to affect rates materially.

Many of the interviews indicated that were there any bias in the reported income, it would take the form of over-reporting by young respondents and under-reporting by older persons. The potential effect of this on rates of return is demonstrated with the hypothetical example in Table 13. Using the actual figures for All University Graduates in the North Region, the income of the Age 27 group was reduced ten percent; the income of the Age 32 group was left unchanged; and the income of all succeeding age groups was increased twenty percent. The change in the rate of return is only .05 percent.

Based on these tests, I conclude that the most likely sources of data errors would not affect rates of return appreciably within a fairly broad range.

Summary

Age-Income Profiles.--Each region studied exhibits the expected shapes and levels of age-income profiles when the aggregate samples of All University Graduates and All Secondary Graduates are compared. In all areas, university

TABLE 12

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ALL UNIVERSITY GRADUATES, ALTERNATE TAX RATES[a]

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir. Univ. Costs/Mo.	Mortality	Months in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	.-----	24	-(53.35)	50
21	---	---	---	7,214	3,600	---	.99971	24	-(86.71)	48
23	---	---	---	7,214	3,920	396	.99971	36	-(132.80)	46
25	---	---	---	9,136	5,652	348	.99919	18	-(68.92)	44
27	23,513	.15	19,986	9,136	---	---	.99919	42	455.33	42
32	29,319	.15	24,919	11,395	---	---	.99838	60	810.13	37
39	32,384	.20	25,907	14,252	---	---	.99643	120	1,393.61	30
49	29,976	.15	25,480	15,960	---	---	.99085	120	1,131.95	20
59	27,364	.15	23,259	15,575	---	---	.97773	120	901.55	10
68	27,354	.15	23,251	14,750	---	---	.94954	72	581.19	1

[a]Tax Rates - @ 6,000 = 0, @ 6 - 10,000 = 10%,
@10 - 30,000 = 15%, @ 30 - 50,000 = 20%,
@ 50,000 up = 40%

Private Rate of Return: 20.00

TABLE 13

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ALL UNIVERSITY GRADUATES
OVER/UNDER INCOME REPORTING

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Months in Period	Flow Per Period Cr$x1,000	Yrs.to End
19	---	---	---	5,573	3,350	---	-------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
25	---	---	---	10,454	6,177	428	.99919	18	-(84.62)	44
27	23,513	(-10%).0644	19,799	10,454	---	---	.99919	42	392.17	42
32	29,317	(± 0%).0644	27,429	13,040	---	---	.99838	60	861.94	37
39	32,384	(+20%).0644	36,358	16,309	---	---	.99643	120	2,397.29	30
49	29,976	(+20%) .0644	33,655	18,263	---	---	.99085	120	1,830.14	20
59	27,364	(+20%).0644	30,722	17,823	---	---	.97773	120	1,513.41	10
68	27,354	(+20%).0644	30,711	16,879	---	---	.94954	72	945.65	1

Private Rate of Return: 20.6799

graduates' incomes begin at a higher level than their secondary graduate counterparts. This is followed by income increases within the university group at a higher rate than the secondary graduates' incomes. The recovery of the additional educational investment is thus accomplished.

Between educational specialties, many significant differences in age-income profiles are found. Incomes of Law and Medicine graduates increase at a slower rate than in the case of Engineering graduates. This is at least in part attributable to the higher degree of "general" on-the-job training received by the former groups compared to the more "specific" nature of training received by engineers.[7] Interviews indicate that several of these cross-section profiles actually represent a locus of points on profiles of age groups with differing qualities of educational investment. This is particularly true in Agronomy, Dentistry, and Pharmacy.

There is evidence that in less urbanized and industrialized areas away from Guanabara, income opportunities not directly related to the university education of many graduates cause an abandonment of their primary profession at an early age. This is particularly true for dentists and doctors.

Income Related Variables.--In general, Males earn more than Females, Heads of Family more than Non-Heads of Family,

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[7]See Gary S. Becker, Human Capital, A Theoretical and Empirical Analysis with Special Reference to Education (New York: National Bureau of Economic Research, 1964), pp. 11-29.

and persons with children more than those without children. If Years of University Completed are grouped into one to three years and four to six years, the latter group has consistently higher incomes than the first. More detailed breakdown leads to uneven results between the regions.

The relationship between Religion and Income varies considerably between areas. In Guanabara and the North Region, Protestants have a clear earnings superiority compared to the Roman Catholics. However, in Espírito Santo, there are no significant differences. It is interesting to note that the percentage of Protestants in the total sample of each area varies inversely with the ratio of Protestant/Roman Catholic income. Thus, Guanabara and the North Region have the lowest percentage of Protestants (4.1 percent and 4.2 percent respectively) and Protestants have higher incomes than Roman Catholics. In Espírito Santo, this percentage is 5.7 and no income differences are reported. In Santa Catarina, the percentage is 13.4 and Roman Catholic incomes exceed Protestant. This suggests that, as the minority group becomes larger, discrimination by the majority increases. More study would be necessary to substantiate this hypothesis, however.

White earnings exceed non-white earnings in all aggregated samples and in almost all of the sub-samples as well. This tends to support the hypothesis that economic discrimination does exist on a racial basis. This is further supported

by comparing the percentage of Whites, Blacks, and "Others" in the total population of each area with similar percentages within the Secondary and University Graduate populations of the regions. Table 14 shows a radical "whitening" of the populations as the educational level increases. A portion of this difference might be attributed to a tendency on the part of the census enumerators to report as "whiter" persons of higher economic or social levels. It is unlikely, however, that the entire difference could be thus explained.

Generalizing the influence of Class of Activity variables indicates that within the several educational specialties, there is very little importance attributable to the occupational class. Even in the aggregate samples of All University Graduates, only the state of Guanabara exhibits large income differentials between these variables. This supports a hypothesis that the various labor markets for university trained personnel are competitive. It could also support the contention that wages are for the most part administered. Both hypotheses probably contribute to the comparatively uniform earnings patterns. Government employment, either full time or as a portion of income, is a significant portion of most professional occupations. This does not necessarily suggest that government sets the wages independently of the free market. On the contrary, in Brazil at the time of the 1960 Census, it is probable that professional job opportunities in the expanding private sector tended to

TABLE 14

PERCENTAGE RACIAL COMPOSITION
TOTAL POPULATION, SECONDARY GRADUATES,
AND UNIVERSITY GRADUATES
BRAZIL - 1960

Area	Population Over Age 19	Secondary Graduates	University Graduates
North Region			
White	24.6	64.3	75.8
Black	4.5	1.1	0.1
Other	70.9	34.6	24.1
Espirito Santo			
White	61.3	88.8	93.5
Black	12.1	1.4	0.3
Other	26.6	9.8	6.2
Guanabara			
White	72.5	94.3	97.5
Black	10.4	1.0	.4
Other	17.1	4.7	2.1
Santa Catarina			
White	94.1	99.0	99.8
Black	3.0	.7	.1
Other	2.9	.3	.1

Source: Brazil, Fundação IBGE, Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, Censo Demográphico de 1960.

force the government to follow rather than lead the market for university created skills. In Guanabara with its comparatively large labor markets and greater proportional university graduate population, incomes between Classes of Activity vary considerably, but in the outlying areas, all types of industry compete for the comparatively small number of graduates available. The large number of all types of university graduates with a history of migration indicates the existence of a necessary condition for competitive labor markets--mobility.

Position, Migration, and Environment.--Incomes of the Self-Employed or Employers lead those of Private Employees, and Public Employees' incomes are the lowest. An unreported factor that must be considered in this ranking is the existence of major fringe benefits for Public Employees not reflected in their current money income. The same would apply to a lesser extent among Private Employees. A trend exists toward higher incomes for those persons having a history of migration from an urban area compared with incomes of persons with no migration history. Lowest in the income ranking are persons with a history of migration from a rural area. A large portion of this latter phenomenon may well be attributable to poorer pre-university training among rural residents. Urban and suburban incomes are consistently greater than those of rural residents. The difficulties in obtaining university trained people in rural areas is often cited as

a major problem. At least one reason for this difficulty is apparent in this differential income structure.

Comparative Results with Secondary Graduates.--The ability of the classes of variables used in this study to explain income variance statistically is considerably greater among secondary graduates than among university graduates. This condition gives considerable support to the hypothesis that increased education decreases the influence of social and economic factors normally affecting earnings. Of particular interest is the relative influence of Class of Activity. In all areas except Guanabara, the difference in explained income variance between University and Secondary graduates is considerable.[8] The comparatively small difference in Guanabara is probably attributable to the relatively better quality of secondary education in Guanabara as well as a greater demand in the state for skills produced at the secondary level as compared to the other regions in the study.

Rates of Return.--Table 15 summarizes the various rate of return calculations for all regions studied. Figures 15 through 18 present the results graphically for each state. Figure 19 shows comparative results among the areas. With notable exceptions, university education generally returns to the individual a rate in excess of the market rate of

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[8]The $\bar{R}^2$ for Secondary and University Graduate samples respectively for each area are as follows for regressions of Class of Activity variables on log income: ES, .204 and .013; NR, .126 and .059; GB, .057 and .039; and SC, .168 and .046.

TABLE 15
RATES OF RETURN

COURSES COMPLETED	ESPÍRITO SANTO			NORTH REGION			GUANABARA			SANTA CATARINA		
	Priv.	Soc. W/O Cap.	Soc. W/ Cap.	Priv.	Soc. W/O Cap.	Soc. W/ Cap.	Priv.	Soc. W/O Cap.	Soc. W/ Cap.	Priv.	Soc. W/O Cap.	Soc. W/ Cap.
All University Grads.	24.95	14.88	8.22	20.73	15.03	9.03	16.74	14.08	10.23	21.88	13.70	7.52
Philosophy	23.90	15.58	5.19	<0	<0	<0	7.28	6.50	4.02	<0	<0	<0
Medicine	25.26	10.85	4.35	21.47	11.87	5.64	13.21	8.96	5.03	27.16	13.98	6.73
Pharmacy	<0	<0	<0	11.66	3.36	<0	2.75	<0	<0	11.51	4.40	1.80
Dentistry	18.27	9.04	3.65	13.43	8.41	3.64	7.68	4.94	1.83	14.15	8.42	4.08
Engineering	28.06	16.70	8.27	24.12	17.30	10.58	22.70	19.92	14.27	24.41	15.28	8.14
Law	24.88	21.96	17.38	18.03	17.39	14.73	15.90	16.75	13.83	21.93	20.37	16.38
Agronomy	35.86	16.14	7.57	11.76	5.16	1.70	15.18	8.70	4.89	40.63	16.22	6.74
Econ./Pol. Sciences	45.07	36.59	31.22	16.45	16.13	10.83	20.32	18.86	16.83	16.82	12.40	10.06
Others	20.44	11.89	6.54	28.42	21.45	13.26	19.38	16.36	12.08	26.39	16.18	8.06
1 Yr. Completed	<0			12.67			5.47					
2 Yrs. Completed	19.52			10.03			6.35					
3 Yrs. Completed	19.82			24.50			15.21					
4 Yrs. Completed	24.17			12.07			10.78					
5 Yrs. Completed	26.04			20.49			18.60					
6 Yrs. Completed	25.27			21.50			13.21					

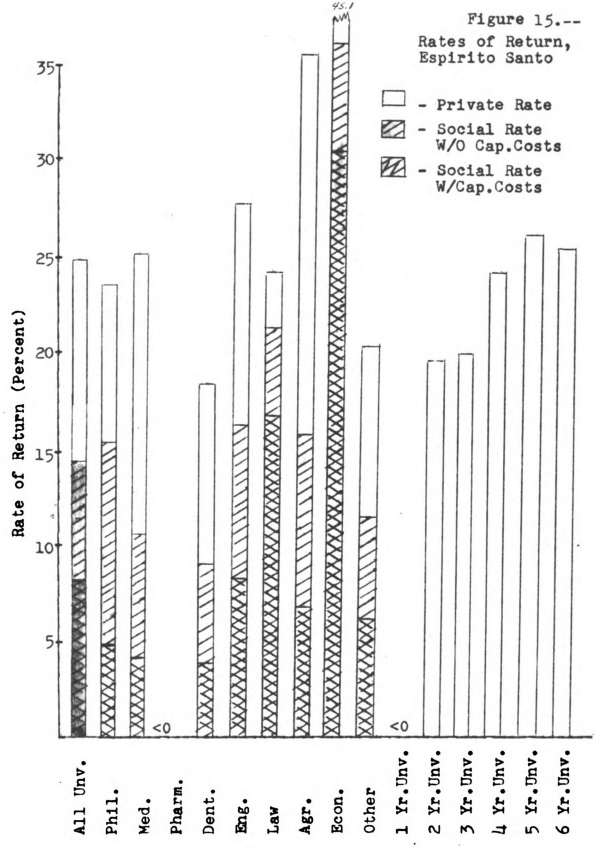


Figure 15.--
Rates of Return,
Espirito Santo

Figure 16.--

Rates of Return, North Region

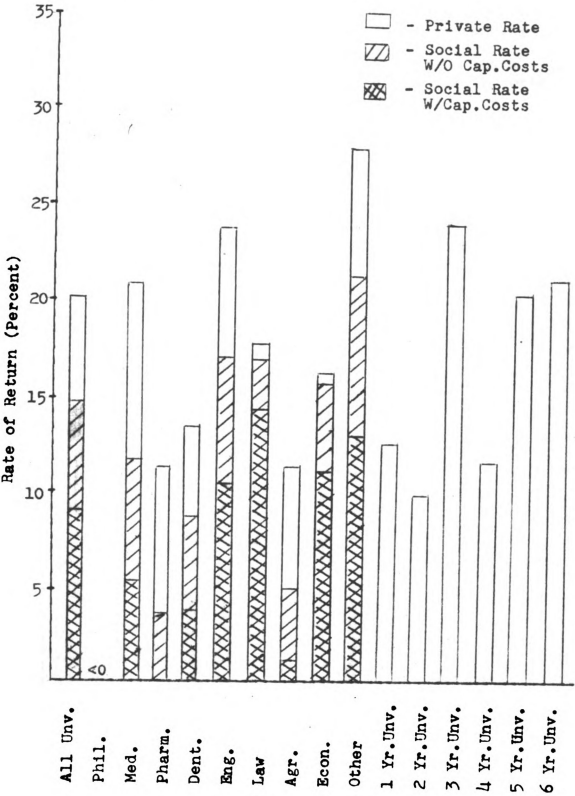


Figure 17.--

Rates of Return, Guanabara

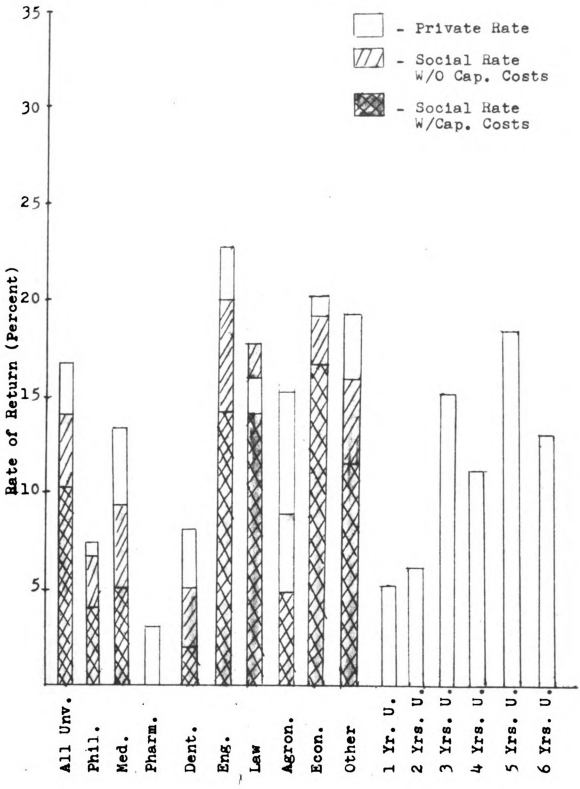
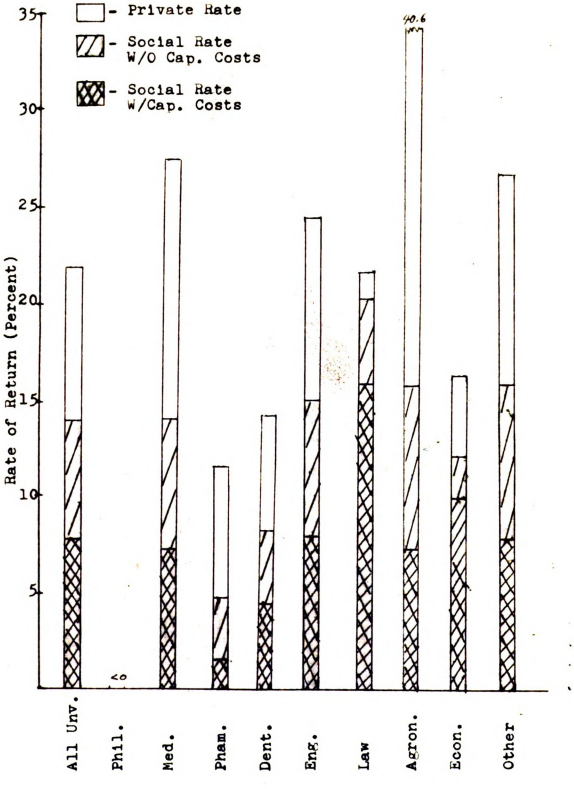
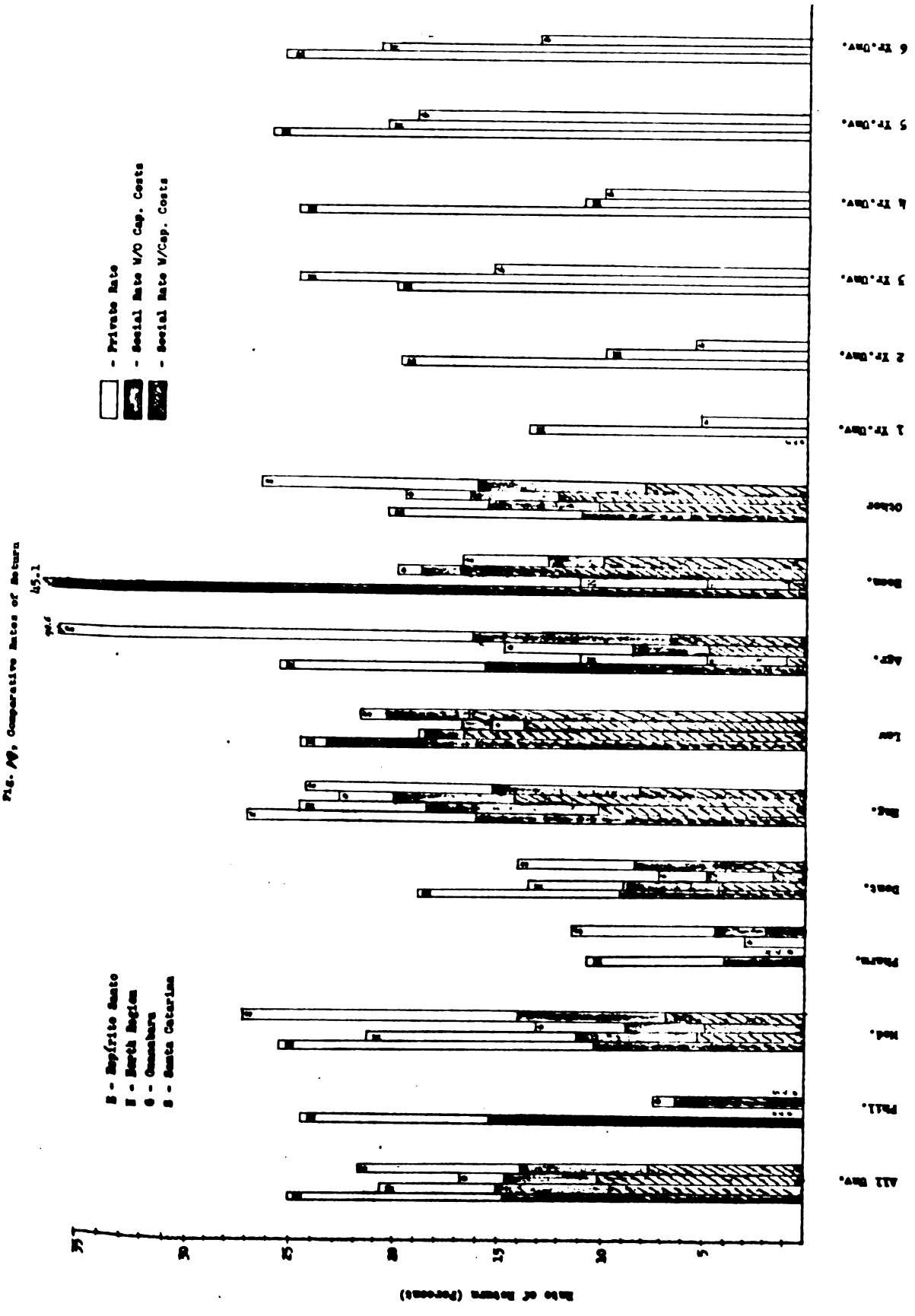


Figure 18.--

Rates of Return, Santa Catarina




Fig. 49. Comparative Rates of Return
45.1
- Private Rate
- Social Rate W/O Cap. Costs
- Social Rate W/Cap. Costs
E - Espírito Santo
F - North Region
G - Guanabara
S - Santa Catarina
Rate of Return (Percent)
ALL Dev.
Publ.
Ind.
Trans.
Comm.
Educ.
Agr.
Hous.
Other
1 Yr. Dev.
2 Yr. Dev.
3 Yr. Dev.
4 Yr. Dev.
5 Yr. Dev.
6 Yr. Dev.

interest on non-human capital (estimated in Chapter III to be twelve percent at the time of the Census). If educational capital costs are ignored, the social rate is equal to or slightly above the non-human capital rate of return. With the inclusion of my estimate of capital costs, the social rate drops well below the non-human rate in most cases. Divergences between private and social rates are considerable with a few exceptions. The Law curriculum consistently yields the lowest divergences in all areas. Economic and Political Sciences also produces comparatively low levels of divergence. Curricula of a more specialized nature such as Medicine and Engineering yield the greatest differences in private and social rates. Comparing regions, Espírito Santo and Santa Catarina have the largest differences in private and social rates followed by the North Region. Guanabara consistently displays the lowest levels of divergence in all of the educational specialties studied. This is due in large measure to the greater income taxes paid on the higher money incomes generally found in the state.

CHAPTER V

POLICY IMPLICATIONS

This study estimates that portion of social and private returns to investment in higher education reflected by incomes earned in the labor markets. It does not attempt to evaluate or measure additional benefits to society that may not be adequately expressed in the reported incomes of university graduates. Such "external" benefits potentially exist but are beyond the immediate scope of this research.

Educational planners should base their resource allocation decisions on the evaluation of <u>total</u> benefits, costs, and available resources existent now and expected in the future. Hence, this study alone cannot provide definitive answers to resource allocation problems. It can and does approximate market-produced benefits and costs connected with university education, thus reducing the planners' problem to the estimation of external benefits only. Investment efficiency questions of resource use are partially answered by comparing rates of return between university curricula as well as non-human capital alternatives. The implications of equity decisions such as who should pay for university education are brought into focus by comparing social and private rates of return. Finally, a study of income-related variables provides insights on the operation of the labor markets and potential

income determinants other than educational attainment. Specific policy questions are treated in the following sections.

Should More or Less Be Invested in Higher Education Relative to Non-Human Capital Alternatives?

Results.--Table 15 shows a range of social rates of return (including capital costs) of 7.5 to 10.2 percent for the sample of All University Graduates. If all capital costs are eliminated from the calculations, the resulting social rates range from 13.7 to 15.0 percent. Private rates of return vary by region from 16.7 to 25.0 percent.

It is difficult to establish a meaningful aggregate real rate of return for non-human capital in Brazil due to the variety of investments involved and the complications introduced by inflation. In making comparisons, it is more useful to choose specific categories of non-human capital for which specific return estimates can be made. For example, twelve percent per annum was chosen in Chapter III as representative of real interest paid on general consumer and building loans in 1960. The conclusions that follow use this figure to represent returns to non-human capital. To the extent that other types of non-human capital yield other interest rates, the conclusions regarding resource allocation would have to be modified.

Comparing the twelve percent non-human capital return with returns from investment in university education indicates that society is receiving approximately the same or slightly lower relative returns from the educational investment.

Investment by the individual in higher learning yields substantially greater returns than the non-human capital alternative.

Conclusions.--Increased relative investment in university education is not justified on the basis of this study alone. The existence of external benefits could provide such justification, but market benefits alone do not.

Policy Implications.--Private rates of return to investment in a university education exceed returns to non-human capital alternatives as well as social investment in higher education. This means that there is market pressure for individuals to increase demand for university training beyond the quantity demanded by society. Three courses of action are open to the government to reduce this divergence.

First, to the extent that current investment efficiency can be improved--that is, costs per student decreased--social rates of return will be improved.

Second, a larger portion of the total costs could be shifted from society to the individual student through some form of tuition payment. This is a politically explosive issue against which a portion of the student body has recently demonstrated as being a further barrier to students of limited financial means. This criticism would not necessarily be valid if a tuition requirement were instituted concurrently with a program of grants and/or loans. In this case, it would mean only that those capable of paying a greater share of their university costs would do so while those unable to pay would be subsidized or allowed to finance their education from future earnings.

Finally, society could recover a greater portion of its cost by taxing income derived from the university training. This might take the form of an educational surtax on post-university earnings with separate rates for graduates of different curricula. In this way, differential rate adjustments could also be used to encourage the development of specialties most desired by society and its planners. Students could also be given the choice of paying for their education at the time or paying such a tax on future earnings.

Again, it must be emphasized that these recommendations are made in the absence of non-market benefit estimates. The existence of such benefits would raise social rates of return without affecting private rates, thus reducing the difference between the two.

How Should the Existing Levels of Investment Among Curricula Be Modified to Increase the Efficiency of University Investments?

Results.--Some of the intercurricular rate of return differentials contained in Table 15 are too small to permit meaningful evaluation. In addition, some of the samples come from professional populations of insufficient size to obtain statistically significant results. Comparison of the results between major curricula is useful for planning purposes. These results are summarized below.

A. Law and Economic Sciences.--University graduates in law produce the highest social rates of return of all curricula

studied.[1] Including capital costs, the rates range from 13.8 to 17.4 percent--generally higher than the non-human capital interest rate. Private rates of return are substantial as well, ranging from 15.9 to 24.9 percent. The resulting divergences are the smallest of any curriculum studied due primarily to the comparatively low cost per student of the university training.

As pointed out in Chapter IV, the content of most law curricula consists of a large number of "liberal arts" and business administration courses and the job holdings of the graduates show a wide dispersion among the several classes of activity.

The same rate of return patterns exist for graduates in Economic Sciences. This curriculum is also comparatively low in social costs per student. As with Law, the name "Economic Sciences" is misleading since the courses included are more heavily business and accounting oriented than would be the case in an undergraduate economics program in the United States.

B. Medicine and Engineering.--Medicine is the curriculum with the highest cost per student of any of the disciplines studied. As shown in Table 15, the social rates of return from graduates of medical schools are the lowest among the three major professions of Law, Medicine, and Engineering. On the other hand, private rates of return are among the

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[1] Graduates of economic and political sciences in Espírito Santo produce a higher return than the law graduates in the state. However, only ten graduates were in the economic and political science sub-sample. Guanabara's engineers also lead law graduates by .4 percent.

highest encountered. The resulting divergences are larger than in any other curriculum studied. The primary reasons for the low social rates are the high costs and comparatively low early lifetime earnings of the graduates.

The private rate of return to engineers is consistently high, ranging from 22.7 to 28.1 percent. Divergences, while lower than Medicine, are still substantial. In Guanabara, the social rate of 14.3 percent exceeds the estimated return to non-human capital. The other areas studied have much lower social returns.

C. Philosophy.--Both private and social rates of return for graduates of Philosophy are among the lowest calculated in this study. As noted in Chapter IV, the wages for a large portion of this group are set by state government (secondary teachers' salaries). This portion is probably large enough to set patterns of alternative earnings for graduates of Philosophy not engaged in teaching. The cost per student in this curriculum is comparatively low (only Law is lower); and the earnings pattern of the early earning years, important to high rates of return, is not unusually low. The general level of earnings at all points in the age-income profiles is not enough greater than the alternative earnings of secondary graduates to produce substantial returns.

D. Other Curricula.--The results for other curricula studied are contained in Chapter IV. Their immediate usefulness in planning is limited. For example, the largest portion of the pharmaceutical industry of Brazil is concentrated in

the states of Rio de Janeiro and São Paulo. Meaningful results for graduates of Pharmacy must await data from those states. Similarly, the large industrial-agricultural areas of Rio Grande do Sul, São Paulo, and Minas Gerais should be included before returns to agronomists are used in policy formation.

Conclusions.--From the standpoint of economic efficiency, society's investment in schools of Medicine and Philosophy is excessive compared to investment in Law and Engineering. This conclusion is certainly contrary to opinions held by many persons concerned with Brazilian higher education and requires careful qualification as follows:

A. As stated before, the results do not consider potential external benefits which may be of particular importance in the fields of medicine and teaching. For example, increased productivity in the community through higher levels of general health, lower rates of communicable disease, etc. may not be reflected in the present wages of doctors.

B. Since most secondary teachers are state employees, some of their wages are received as fringe benefits not reported in the income data used for the study. In addition, it is doubtful that the productive impact of secondary education is fully captured by teacher's wages.

C. High social cost per student and long internship are primarily responsible for the low social returns to investment in medical education. Increasing the efficiency of current investments thus reducing the cost per student would dramatically increase the social return as would shorter periods of internship.

D. Low private and social returns to graduates in Philosophy are largely the result of the low wages received by secondary school teachers.

E. High social rates of return accrue from engineers in Guanabara but are low in the other less developed areas studied where markets for engineers are smaller and levels of money income lower than in Guanabara.

Policy Implications.--The following implications are drawn from these results:

A. Expansion of the type of training provided by schools of Law and Economic Sciences should be expanded due to the high social and private returns, comparatively low costs per student, and flexibility in choice of employment accruing to graduates of these curricula. This should not be interpreted to mean that schools of Law and Economic Sciences should be expanded in precisely their current form. It is entirely possible that greater resource efficiency could be gained by modifying the existing curricula or establishing new curricula embodying and specializing in the courses most responsible for high productivity. For example, if a large portion of lawyers are becoming business administrators, it is likely that specialized training in business administration would be more useful than the general law course.

The low cost per student in these curricula also means that society can produce several graduates for the same price as educating one person in many of the other disciplines. For example, Table 2 in Chapter III indicates the cost of

one graduate in Medicine is over eight times that of a graduate in Law. Even if the social rate of return were similar for the two (it is actually about three to one in favor of Law), substantial benefits might accrue to society from eight university graduates compared to one.

B. Expansion of engineering education is justified by the results from the state of Guanabara but not from other areas. Before a correct policy can be recommended, it is necessary to secure data from other industrialized states, particularly São Paulo and Rio de Janeiro. The implications of the large divergences between social and private rates of return are discussed in section E below.

C. Market-generated results alone do not justify greater relative investment in medical education. Such justification must come from evaluation of external benefits, lower social costs per student, or increased productivity during the early earning years of doctors. Any one of these factors could raise the social rate of return from the comparatively low rate found to exist in this study.

D. If increasing the quality and quantity of secondary education is a national goal, wages of secondary teachers (graduates in Philosophy) must be improved. In 1960, Brazilian secondary schools were enrolling about eleven percent of the persons in secondary school age groups.[2] Educators,

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[2]Brazil, Ministério do Planejamento e Coordenação Econômica, Escritório de Pesquisa Econômica Aplicada (EPEA), Plano Decenal de Desenvolvimento Econômico e Social, "Educação (1) Diagnóstico Preliminar" (Rio de Janeiro: 1966), p. 41.

educational planners, and politicians interviewed during the course of this research universally agreed that expansion of the secondary system was and is a highly ranked goal of national policy. Yet the relative salaries paid to a major input in the secondary system, university-educated teachers, did not reflect this desire. It is true that fringe benefits are an important component of many teachers' salaries and these benefits are not included in the results of this study. Nevertheless, even a substantial allowance for such benefits would not raise rates of return to teachers to the levels of graduates of most of the other curricula.

The relationship between available openings (vagas) in schools of Philosophy and applicants for those openings in 1965 shows the expected market reaction to these low incomes and rates of return.[3] While many schools were experiencing serious shortages of openings for students compared to applicants, schools of Philosophy reported available openings of 21,363 with approved applicants of 21,733 but actual admissions of only 11,529.

This situation is an excellent example of the way in which a rate of return study can be used in conjunction with others using the Manpower Approach. Desired numbers of teachers can be estimated for future periods. Facilities can be developed to provide the necessary training. However,

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[3]Data are from J. D. Ryder, "Study of Enrollments," Appendix C of Final Report of the United States Team on Brazilian Higher Education to the Midwestern Universities Consortium for International Activities, (Milwaukee: 1968).

unless the factors of costs and market incentives are included in the planning equation, the entire program may fail.

E. Unreimbursed subsidies to students are indicated by the divergences between social and private rates of return, particularly in Engineering and Medicine. These explain part of the current crisis involving larger numbers of applicants than can be handled by existing facilities. The returns to the individual based on his investment in a university education are substantially greater than those to the society which is providing the training facilities. These divergences also raise the equity question of who should pay for university education. If this question is answered by saying those who receive the benefits should pay a larger portion of the total cost, a system of tuition or a surtax on professional income would be in order.

Information from Income-Related Variables

A. Operation of the Labor Markets.--The preceding discussions imply that intentional intervention in the labor markets may be a desirable way to implement educational policy. For example, the low wages of graduates in Philosophy might be raised to encourage entry into the field of secondary teaching. Some insight into the workings of the labor markets is gained by examining incomes and variables which would be expected to relate to earnings. One category of these variables is the Class of Activity in which graduates from a given curriculum are employed. The lack of large wage differentials between different occupational classes can

indicate a type of market in which wages in different occupations reach a common level through competition. It is also true that similar wages could be indicative of administered wages either on the part of the employers or the university graduates concerned.

The entire Rate of Return Approach is critically dependent on the hypothesis that increasing relative investment in a given field will decrease the rate of return. In other words, if the rate of return is high for one investment compared to an alternative, increasing investment in the first or decreasing the investment in the alternative will tend to equate the two rates of return. This hypothesis is supported by an interregional comparison of private rates of return to graduates of Medicine. As stated in Chapter IV, there is a perfect correlation between the number of inhabitants per doctor and the private rate of return to doctors between the four areas studied. Thus, the greater relative scarcity of doctors, the greater is the return to those doctors. Other factors, such as interregional income differences, could also explain this correlation, but the results are at least consistent with the given hypothesis.

Analysis of the migration records of university graduates shows substantial numbers have migrated and that generally, those persons have larger incomes than persons with the same educational background who have remained in the place of their birth. This demonstrates the existence of labor mobility which is a necessary condition for the operation of a competitive labor market.

Finally, a study of income differences among graduates of a given discipline by Position in Occupation displays substantial differentials between Private Employees, Public Employees, and the Self Employed. These differentials do not, however, necessarily indicate imperfect markets. The frequent multiple job holdings and fringe benefits of public employees tend to increase the real wages of this group over reported money incomes. For the Self-Employed group, it is reasonable to assume that their reported salaries include a return for entrepreneurial efforts and should be expected to exceed salaries of Private Employees.

The discussion above is not intended to prove the existence of perfectly competitive markets for professional skills. It does offer, however, some evidence that these markets operate with enough efficiency to permit their use in implementing educational policy.

B. Discrimination.--A review of the relationships between income and variables contained in the Sex, Race, and Religion classes indicates substantial income differences related to these characteristics.[4] Among university graduates, Whites and Males generally report larger incomes than non-Whites and Females. Differences in incomes between Roman Catholics and non-Roman Catholics vary between regions and occupations. If these results are caused by discrimination, optimal use of human capital investment is not taking place. Wage discrimination for a similar product implies

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[4] See Chapter IV

either the favored group is receiving excessive returns or those discriminated against are not receiving the value of their products.[5]

Lower female earnings may be the result of part-time employment rather than discrimination. This reduces the rate of return to the educational investment in the part-time worker as compared to persons with similar training who continue full-time participation in the labor market. This loss of market return may be partially recovered through improved education of the succeeding generation by mothers in the home.

Other Uses of the Census Data

The magnetic computer tapes from the Census Bureau contain data in addition to those discussed in Chapter III. Included is information concerning place of birth, nationality, length of residence in present município, marital status, number of children both total and living, reason for unemployment (if applicable), and detailed occupation as opposed to the general Class of Activity used in this study. Many more studies can be done profitably using this additional data as well as those already described. Some examples are given below.

A. Some additional work already underway involves the relationship between size of family, educational attainment,

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[5]Gary S. Becker, Human Capital, A Theoretical and Empirical Analysis with Special Reference to Education (New York: National Bureau of Economic Research, 1964), Chapter IV.

and income. The hypothesis to be tested is that increased levels of education and income result in lower birth rates and smaller families.

B. A detailed study of incomes and specific occupations can be made to determine the extent to which graduates are working in occupations directly related to their formal education. This would be particularly useful in evaluating course changes in existing university programs.

C. The educational specialties and occupations of the secondary graduates in the samples can be correlated with income to determine the relative values of vocational and classical secondary curricula.

D. Patterns of unemployment can be studied in relation to cause, education, family composition, etc.

E. Family composition, race and religious characteristics can provide other social scientists with extensive data for studies in their field which previously have been impossible.

In all cases, the availability of data from other states in Brazil will improve the quality and usefulness of such studies.

Further Recommendations

Data from Other Areas.--The research completed thus far is based on data covering approximately thirteen percent of the population of Brazil. Continuing the study for the balance of the country can result in comparative information on rates of return and professional incomes for such important

and diverse areas as São Paulo, Rio Grande do Sul, and the Northeast. The results for all curricula studied would be made more reliable by the expanded data; and for the professions of Engineering, Agronomy, and Pharmacy data from areas not now included are essential for accurate policy conclusions. Tentative arrangements have been made with Fundação Getúlio Vargas to obtain data for the rest of Brazil.

Returns to Other Levels of Education.--No attempt has been made to determine the comparative returns to investment in primary, secondary, and university education. Such a comparison would aid planners in determining resource allocation between these levels. Income data for secondary graduates is already available in the computer tapes used in this study. Additional data on incomes of persons with and without primary education would be required as well as information on the costs of primary and secondary schools.

Comparative Results Using the 1970 Census.--If the existing cross-section data can be augmented by data from the forthcoming 1970 Census, time-series analysis can supplement and probably improve the present results. This is particularly true in evaluating the impact of secular changes which of necessity were assumed to be constant in this study.

Two changes by IBGE in the format and procedures of the 1960 Census would be useful in making the 1970 Census more valuable for this type of research. First, there are no broadly based data available on the phenomenon of multiple job holdings in the country, nor the incomes associated with the several jobs. A provision to ask for this information

in the 1970 Census is desirable. Second, it would be useful to have a carefully prepared random sample from the Census available at an early date from which tentative but timely results could be derived.

Improved University Cost Data.--In the past, the lack of uniform accounting systems has made university cost estimation and comparison difficult and imprecise. Continued efforts by the Ministry of Education and Culture to remedy this situation will improve the accuracy and usefulness of all types of university cost/benefit analyses.

Studies of External Benefits.--It has been stated several times that this study measures only benefits of university education reflected by the labor markets. Effective use of rate of return results to plan university resource allocation requires identification and quantification of potential external benefits.

BIBLIOGRAPHY

BIBLIOGRAPHY

Public Documents

Brazil, Comissão de Reforma do Ministério da Fazenda. Estudos de Administração Fiscal (Por Técnicos Americanos). Rio de Janeiro: Fundação Getúlio Vargas, 1967.

Brazil, ERGO - Consultória Econômica e Estatística (Sociedade Civil). Análise Econômica das Universidades Brasileiras. Rio de Janeiro: 1966. Vols. I and II.

Brazil, Fundação Getúlio Vargas, O Trabalho de Engenheiros e Técnicos na Indústria e a sua Formação. Rio de Janeiro: Fundação Getúlio Vargas, 1963/1964.

Brazil, IBGE, Anuário Estatístico do Brasil 1961. Rio de Janeiro: IBGE, 1961.

Brazil, IBGE, Anuário Estatístico do Brasil 1963. Rio de Janeiro: IBGE, 1963.

Brazil, IBGE, Anuário Estatístico do Brasil 1967. Rio de Janeiro: IBGE, 1967.

Brazil, IBGE - Serviço Nacional de Recenseamento, Censo Demográfico de 1960, Acre-Amazonas-Pará. Rio de Janeiro: IBGE, 1960.

Brazil, IBGE - Serviço Nacional de Recenseamento. Censo Demográfico de 1960, Espírito Santo. Rio de Janeiro: IBGE, 1960.

Brazil, IBGE - Serviço Nacional de Recenseamento. Censo Demográfico de 1960, Rondônia, Roraima, Amapá. Rio de Janeiro: IBGE, 1960.

Brazil, IBGE - Serviço Nacional de Recenseamento. Censo Demográfico de 1960, Santa Catarina. Rio de Janeiro: IBGE, 1960.

Brazil, IBGE - Serviço Nacional de Recenseamento. Censo Demográfico: Resultados Preliminares. Rio de Janeiro: IBGE, 1960.

Brazil, Serviço Nacional de Recenseamento. Instruções ao Recenseador. Rio de Janeiro: IBGE, 1960.

Brazil. Ministério da Fazenda. Relatório das Atividades do ano de 1960. Rio de Janeiro: Departamento de Imprensa Nacional, 1963.

Brazil. Ministério do Planejamento e Coordenação Econômica. Plano Decenal de Desenvolvimento Econômico e Social. Vols. I (I and II). Rio de Janeiro: Departamento de Imprensa Nacional 1967.

Brazil. Serviço Estatística de Educação e Cultura - Ministério de Educação e Cultura. Sinópse: Despesas com o Ensino, 1961. Rio de Janeiro, MEC, 1964.

Brazil. Serviço de Estatística da Saude. Médicos. Rio de Janeiro: Ministério da Saude, 1964.

U.S. Department of Commerce. Brazil, Information for United States Businessmen. Washington, D.C.: U.S. Government Printing Office, 1961.

Books

Adams, Don. Educational Planning. Syracuse: Syracuse University Press, 1964.

Ashby, Eric. Investment in Education: The Report of the Commission on Post School Certification and Higher Education in Nigeria. Nigeria: Federal Ministry of Education, 1960.

Becker, Gary S. Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. New York: National Bureau of Economic Research, 1964.

Benjamin, Harold R. W. Higher Education in the American Republics. New York: McGraw-Hill Book Co., Inc. 1965.

Correa, H. The Economics of Human Resources. Amsterdam: North Holland Publishing Co., 1963.

Friedman, M. and Kuznets, S. Income from Independent Professional Practices. New York: National Bureau of Economic Research, 1945.

Haavelmo, Trygve. A Study in the Theory of Investment. Chicago: University of Chicago Press, 1960.

Harbison, F. and Myers, C. Education, Manpower and Economic Growth. New York: McGraw-Hill Book Co., Inc. 1964.

Havighurst, Robert J. and Moreira, J. Roberto. Society and Education in Brazil. Pittsburgh: University of Pittsburgh Press, 1965.

Hirschman, A. O. The Strategy of Economic Development. New Haven: Yale University Press, 1958.

Johnston, J. Econometric Methods. New York: McGraw-Hill, 1963.

Klein, Lawrence R. An Introduction to Econometrics. Englewood Cliffs, N. J.: Prentice-Hall, 1962.

Marshall, Alfred. Principles of Economics - 8th Edition. London: Macmillan Co., 1946.

Mushkin, Selma J. Economics of Higher Education. Washington, D.C.: United States Government Printing Office, 1962.

Oliveira, A. B., and Carvalho, J. Z. S. A Formação de Pessoal de Nivel Superior e o Desenvolvimento Econômico. Rio de Janeiro: Campanha Nacional de Aperfeiçoamento de Pessoal de Nivel Superior (CAPES), 1960.

Pesek, Boris P. and Saving, Thomas R. Money, Wealth and Economic Theory. New York: Macmillan Co., 1967.

Quirin, G. David. The Capital Expenditure Decision. Homewood, Illinois: Richard D. Irwin, Inc., 1967.

Schultz, Henry. The Theory and Measurement of Demand. Chicago: University of Chicago Press, 1938.

Schultz: Theodore W. The Economic Value of Education. New York and London: Columbia University Press, 1964.

Smith, Adam. Wealth of Nations. New York: Modern Library, 1937.

Wesibrod, Burton A. External Benefits of Public Education: An Economic Analysis. Princeton: Industrial Relations Section, Princeton University, 1964.

Articles and Periodicals

Becker, Gary S. "Investment in Human Capital: A Theoretical Analysis," Journal of Political Economy, Supplement LXX, (October 1962).

_____. "Underinvestment in Education?" American Economic Review, L, (May 1960), 346-354.

Blaug, Mark. "The Rate of Return on Investment in Education in Great Britain," Manchester School of Economic and Social Studies, XXXIII (September 1965), 205-261.

Bridgeman, D. S. "Problems in Estimating the Monetary Value of College Education," Review of Economic Studies, XLII, (August 1960).

Campbell, Robert and Siegel, Barry N. "The Demand for Higher Education in the United States," American Economic Review, LVII (June 1968).

Carnoy, Martin. "Education in Latin America: An Empirical Approach," as contained in Viewpoints on Education and Social Changes in Latin America, Center for Latin American Studies, University of Kansas, BCC Paper #5, December 1965.

Clark, H. F. "The Return on Educational Investment," in Yearbook of Education. London: Evans Brothers, 1956.

Fisher, A. G. B. "Education and Relative Wage Rates," International Labor Review, Vol. 25, (June 1932) 742-64.

Glick, Paul C. and Miller, Herman P. "Educational Level and Potential Income," American Sociological Review, XXI, (June 1956), 307-12.

Hansen, W. Lee. "Total and Private Rates of Return to Investment in Schooling," Journal of Political Economy, LXXI (April 1963), 128-140.

Houthakker, H. S. "Educational and Income," Review of Economics and Statistics, XLI (February 1959), 24-28.

Miller, H. P. "Annual and Lifetime Income in Relation to Education," American Economic Review, (December 1960).

Mincer, Jacob. "Investment in Human Capital and Personal Distribution of Income," Journal of Political Economy, LXVI (August 1958), 281-302.

_____. "On-the-Job Training: Costs, Returns, and Some Implications," Journal of Political Economy Supplement, LXX, (October 1962).

Morgan, James and David, Martin. "Education and Income," Quarterly Journal of Economics, LXXVII (August 1963).

Renshaw, E. F. "Estimating the Returns to Education," Review of Economic Studies (August 1960).

Shaffer, H. G. "Investment in Human Capital: Comment," American Economic Review (December 1961).

Schultz, T. W. "Capital Formation by Education," Journal of Political Economy, LXVIII (December 1960), 571-83.

_____. "Investment in Human Capital," American Economic Review (March 1961).

_____. "Investment in Human Capital: Reply," American Economic Review (December 1961).

Scitovsky, Tibor. "An International Comparison of the Trend of Professional Earnings," American Economic Review, LVI (March 1966), 25-42.

Swift, William J. and Weisbrod, Burton A. "On the Monetary Value of Education's Intergeneration Effects," Journal of Political Economy, LXIII (December 1965), 643-49.

Weisbrod, Burton A. "Education and the Investment in Human Capital," Journal of Political Economy Supplement, LXX (October 1962).

_____. "The Valuation of Human Capital," Journal of Political Economy, LXIX (October 1961), 425-431.

Reports

Center of Latin American Studies. Viewpoints of Education and Social Change in Latin America. Kansas: The University of Kansas, 1965.

Denison, E. F. The Sources of Economic Growth in the United States and the Alternatives Before Us. Washington D.C.: CED 1961.

Filho, Joaquim Faria Góes. Mão-de-obra Industrial. Rio de Janeiro: Serviço Nacional de Aprendizagem Industrial, SENAI, 1966.

Montavon, Paul. Some Questions on Education and Economic Development. Viewpoints on education and social change in Latin America, occasional publications number five, Center of Latin American Studies, University of Kansas, 1965.

Williams College. The Productivity of Education in Chile. Research Memorandum No. 12, Center for Development Economics, Williams College, Williamston, Mass. 1967.

Unpublished Material

Carnoy, Martin. "The Cost and Return to Schooling in Mexico: A Case Study." Unpublished Ph.D. dissertation, University of Chicago, 1964.

Chipman, J. S. "A Proposal for Extracting a Sample from the 1960 Census for the Purpose of Estimating the Rate of Return to Investment in Education in Brazil." Unpublished paper from Ministério do Planejamento e Coordenação Econômica, Escritório de Pesquisa Econômica Aplicada.

Klotsche, J. Martin; Hunter, John M.; Hoge, Henry; and Ryder, J. D. "The Final Report of the United States Team on Brazilian Higher Education," unpublished report to the Midwestern Universities Consortium for International Activities. Milwaukee: 1968.

O'Brien, F. A. "A Preliminary Study of Income Distribution in Brazil," unpublished paper for Brazil, Ministério do Planejamento e Coordenação Econômica, Instituto de Pesquisa Econômico-Social Aplicada. Rio de Janeiro: 1968.

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PROFESSIONAL INCOMES AND RATES OF RETURN TO HIGHER EDUCATION IN BRAZIL

VOLUME II

By

Augustus James Rogers III

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Economics

1969

APPEN

REGRESSION RE

APPENDIX I

REGRESSION RESULTS BY AREAS

THE ESPIRIT

Table 16 contains the
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regressions are discuss

THE ESPÍRITO SANTO STUDY

Table 16 contains the number of persons in the total population of Espírito Santo at the time of the 1960 Census who had completed university courses and those that had completed the secondary level. These figures are taken from the total census enumeration, not the twenty-five percent sample. Column (4) shows the number of employed persons in my sample. Column (5) gives the percentage of the total population represented by the sample for each university group as well as the secondary graduates. In the aggregate, the sample is close to the twenty-five percent it is supposed to represent. Within the groups, it varies from eighteen to forty percent which is to be expected with the small sub-populations involved. The sampling technique was to obtain one in every four households, but not necessarily one of every four university graduates. Table 17 lists the sub-samples on which regressions are performed, the variable key, and the size of each cell of observations. The criteria used in selecting the regression sub-samples were that the person was employed with an income and was not a seminary graduate. Seminarians were eliminated because it is doubtful that the market wages reflect a significant part of their received benefits. The more important results of each series of regressions are discussed below.

TABLE 16

ESPÍRITO SANTO
POPULATION AND SAMPLE COMPOSITION

Census Code (1)	Course (2)	Total Pop.[a] (3)	Employed Sample[b] (4)	(4) as Percent of (3) (5)
50	Geography and History (Philosophy)	25	10	40
51	Natural History (Philosophy)	9	2	22
52	Letters (Philosophy)	69	14	20
53	Mathematics (Philosophy)	25	5	20
54	Other (Philosophy)	58	16	18
57	Fine Arts	8	*	*
60	Medicine	298	88	30
61	Pharmacy	142	25	18
62	Dentistry	316	89	28
63	Veterinary Medicine	34	*	*
64	Engineering	223	61	27
65	Arquitecture	12	*	*
66	Industrial Chemistry	8	*	*
67	Law	791	222	28
68	Agronomy	91	28	31
70	Economic and Political Sciences	37	10	27
71	Statistics	1	*	*
73	Sanitary Services	8	*	*
74	Military	62	*	*
76	Physical Education	2	*	*
78	Seminary	106	37	35
79	Public Services	0	*	*
-	Other Course Completed	-	34	-
	Total University Graduates	2325	604	26
40	Employed Secondary Graduates	7891	2023	26

[a]Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, Censo Demográfico de 1960. (Rio de Janeiro: 1967)

[b]Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, VII Recenseamento Geral do Brasil 1960, 25 Percent Sample.

TABLE 17

VARIABLE KEY AND SAMPLE COMPOSITION

ESPÍRITO SANTO - 1960 CENSUS DATA

Variable Number and Description	SAMPLE COMPOSITION																	
	Total	Total univ.	Total second.	1 yr. univ.	2 yrs. univ.	3 yrs. univ.	4 yrs. univ.	5 yrs. univ.	6 yrs. univ.	Phil.	Medic.	Pharm.	Dent.	Engin.	Law	Agron.	Econ. Pol.Sc.	Other Univ. Courses
Years of University Completed																		
z_1 - 1 year	33	0	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0
z_2 - 2 years	30	0	30	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0
z_3 - 3 "	115	90	25	0	0	115	0	0	0	11	0	17	44	0	0	0	0	18
z_4 - 4 "	152	141	11	0	0	0	152	0	0	36	0	8	45	0	0	28	10	14
z_5 - 5 "	286	285	1	0	0	0	0	286	0	0	0	0	0	61	222	0	0	2
z_6 - 6 "	88	88	0	0	0	0	0	0	88	0	88	0	0	0	0	0	0	0
Age																		
z_7 - 19 years midpoint	93	0	93	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
z_8 - 22 " "	726	20	706	15	8	14	11	4	1	7	1	0	4	3	1	3	0	1
z_9 - 27 " "	690	134	556	9	10	27	46	63	8	16	8	2	31	16	47	5	3	6
z_{10} - 32 " "	452	133	319	6	7	21	36	42	18	10	18	5	20	11	51	7	2	9
z_{11} - 39 " "	348	144	219	1	5	21	24	82	21	9	21	1	12	16	64	6	3	12
z_{12} - 49 " "	204	119	85	0	0	17	25	54	28	4	28	6	15	5	48	6	1	6
z_{13} - 59 " "	77	39	38	1	0	10	6	15	11	1	11	7	4	9	6	1	0	0
z_{14} - 68 " "	22	15	7	0	0	5	4	6	1	0	1	4	3	1	5	0	1	0
Course Completed																		
z_{15} - Secondary	2023	0	2023	33	30	25	11	1	0	0	0	0	0	0	0	0	0	0
z_{16} - Philosophy	47	47	0	0	0	11	36	0	0	47	0	0	0	0	0	0	0	0
z_{17} - Medicine	88	88	0	0	0	0	0	0	88	0	88	0	0	0	0	0	0	0
z_{18} - Pharmacy	25	25	0	0	0	17	8	0	0	0	0	25	0	0	0	0	0	0
z_{19} - Dentistry	89	89	0	0	0	44	45	0	0	0	0	0	89	0	0	0	0	0
z_{20} - Engineering	61	61	0	0	0	0	0	61	0	0	0	0	0	61	0	0	0	0
z_{21} - Law	222	222	0	0	0	0	0	222	0	0	0	0	0	0	222	0	0	0
z_{22} - Agronomy	28	28	0	0	0	0	28	0	0	0	0	0	0	0	0	28	0	0
z_{23} - Econ./Pol. Science	10	10	0	0	0	0	10	0	0	0	0	0	0	0	0	0	10	0
z_{24} - All other courses completed except Seminary	34	34	0	0	0	18	14	2	0	0	0	0	0	0	0	0	0	34
Sex																		
z_{25} - Female	1135	97	1078	6	3	19	28	16	2	23	2	5	5	0	16	0	1	5
z_{26} - Male	1492	917	965	27	27	96	124	270	86	24	86	20	84	61	206	28	9	29

Head of Family																		
z_{27}- Not Head	1494	136	1358	18	14	36	53	90	13	23	13	8	29	11	39	4	1	8
z_{28}- Head	1133	448	685	15	16	79	99	236	75	24	75	17	60	30	183	24	9	26
Religion																		
z_{29}- Protestant	151	38	113	1	3	10	16	11	3	13	3	4	5	1	9	0	0	3
z_{30}- Jewish	3	1	2	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
z_{31}- Other	123	29	94	2	1	8	9	11	4	0	4	2	7	3	8	2	1	2
z_{32}- Roman Catholic	2350	536	1814	30	26	97	126	264	81	33	81	19	77	37	205	26	9	89
Race																		
z_{33}- Black	29	2	27	0	0	0	1	1	0	1	0	0	0	0	1	0	0	0
z_{34}- White	2361	564	1797	31	28	110	140	268	81	45	81	24	82	39	286	24	10	33
z_{35}- Other	236	37	199	2	2	5	11	17	6	1	6	1	7	2	15	4	0	1
Children																		
z_{36}- Has Children	1253	420	833	7	11	65	91	215	64	25	64	18	53	45	167	17	9	22
z_{37}- No Children	1374	184	1190	26	19	50	61	71	24	22	24	7	36	16	95	11	1	12
Class of Activity																		
z_{38}- Agriculture	58	19	39	0	0	2	14	3	0	1	0	1	3	1	2	8	0	3
z_{39}- Extractive	17	4	13	0	1	1	1	3	0	0	0	0	1	3	0	0	0	0
z_{40}- Mfg. Industry	101	24	77	2	4	6	2	19	0	0	0	1	0	12	7	0	0	4
z_{41}- Commerce, Transportation	562	94	468	11	9	25	21	99	1	1	1	16	5	16	42	6	5	8
z_{42}- Service Industries	37	1	36	3	0	1	0	1	0	0	0	0	0	0	1	0	0	0
z_{43}- Government or Other	370	145	225	7	13	18	22	107	5	1	5	1	3	17	90	7	1	20
z_{44}- Liberal Professions	338	181	157	0	1	33	46	65	40	0	40	2	68	10	54	4	2	1
z_{45}- Social Services	1144	136	1008	10	2	29	46	29	42	44	42	4	9	2	26	3	2	4
Position																		
z_{46}- Public Employee	1469	263	1206	17	16	38	56	141	42	24	42	4	11	25	116	12	5	24
z_{47}- Employer or Own Account	476	235	242	3	6	53	53	90	44	1	44	19	70	12	77	5	3	3
z_{48}- Private Employee	681	106	575	13	8	24	40	55	2	22	2	2	7	24	29	11	2	7
Migration																		
z_{49}- No Migration	1272	225	1047	13	12	49	51	110	28	19	28	8	41	20	90	6	3	10
z_{50}- From Rural	212	37	175	6	5	7	11	19	2	5	2	1	5	0	19	2	1	2
z_{51}- From Urban	1142	342	800	14	13	59	90	157	58	23	58	16	43	41	113	20	6	22
Environment																		
z_{52}- Urban	2136	504	1592	33	27	104	127	259	85	44	85	22	75	56	201	22	10	29
z_{53}- Suburban	228	31	197	0	2	4	11	18	2	3	2	0	7	3	14	1	0	1
z_{54}- Rural	243	29	234	0	1	7	14	9	1	0	1	3	7	2	7	5	0	4

Table 18 contains th
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Table 19 contains
log income on vario
University Graduates
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account for eighteen pe
interdependence between
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Years Completed s

Table 18 contains the regression results for the total sample containing both university and secondary graduates. Of particular interest is the fact that each year of completed university beyond the secondary level is consistent with increased earnings (Table 18, Regression 2). The intercept group in this case includes all secondary graduates plus those completing one year of university training. The other influences are discussed for the sub-samples separately. All the variables together account for fifty-three percent of income variance, which is higher than either the secondary group or university group taken alone. This is probably attributable to the fact that this sample permits examination of income variance between secondary and university graduates while the stratified samples consider only income variances within each educational level.

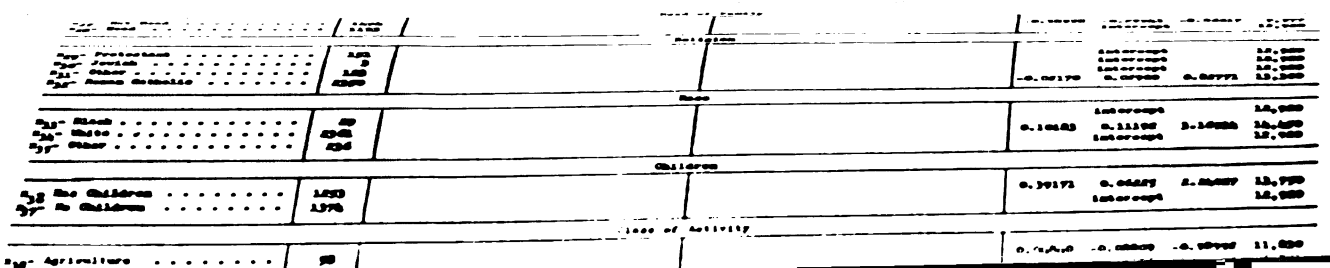
Table 19 contains the results of fourteen regressions of log income on various combinations of variables for the All University Graduates sub-sample. Age alone accounts for approximately seven percent of income variance; Years Completed alone, ten percent; but the two classes together account for eighteen percent. Hence, there is very little interdependence between the Age and Years Completed classes. Course Completed explains twelve percent of variance, and this amount, plus the seven percent explained by Age, produces the expected joint $\overline{R}^2$ of nineteen percent. No regression is performed which includes both Course Completed and Years Completed since there is a strong interdependence

TABLE / 8

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	33						intercept		16,546		intercept		12,920
x_2 - 2 years	30					0.00045	0.17389	1.57796	19,689	0.00045	-0.08117	-0.80625	11,912
x_3 - 3 years	115					0.07439	0.24466	4.17813	21,132	0.07439	0.10708	1.97762	14,380
x_4 - 4 years	152					0.17004	0.52500	10.19742	27,970	0.17004	0.44663	9.31343	20,194
x_5 - 5 years	286					0.37753	0.73009	18.14559	34,337	0.37753	0.53187	13.77345	21,991
x_6 - 6 years	88					0.23726	0.79397	11.70002	36,608	0.23726	0.69094	10.60343	25,783
Age													
x_7 - 19 years midpoint	93	-0.17613	-1.31932	-17.51744	5,749	-0.17613	-1.05717	-14.95357	5,749	-0.17613	-0.54407	-7.74592	7,498
x_8 - 22 " "	726	-0.37959	-1.07840	-25.88589	7,315	-0.37959	-0.83595	-20.81137	7,172	-0.37959	-0.42558	-9.69379	8,441
x_9 - 27 " "	690	-0.10243	-0.72885	-17.34510	10,375	-0.10243	-0.58965	-14.96174	9,175	-0.10243	-0.33963	-8.80110	9,199
x_{10} - 32 " "	452	0.09608	-0.42688	-9.34589	14,033	0.09608	-0.35236	-8.31684	11,632	0.09608	-0.20617	-5.26938	10,513
x_{11} - 39 " "	343		intercept		21,505		intercept		16,546		intercept		12,920
x_{12} - 49 " "	204	0.29072	0.19786	3.48903	26,210	0.29072	0.07306	1.38195	17,800	0.29072	0.04871	1.01593	13,565
x_{13} - 59 " "	77	0.13457	0.01825	0.22451	21,901	0.13457	-0.04791	-0.63508	15,772	0.13457	-0.11007	-1.60140	11,573
x_{14} - 68 " "	22	0.07458	0.04751	0.33390	22,552	0.07458	-0.07660	-0.58037	15,326	0.07458	-0.16779	-1.40532	10,924
Course Completed													
x_{15} - Secondary	2023												
x_{16} - Philosophy	47												
x_{17} - Medicine	88												
x_{18} - Pharmacy	25												
x_{19} - Dentistry	89												
x_{20} - Engineering	61												
x_{21} - Law	222												
x_{22} - Agronomy	28												
x_{23} - Econ./Fol. Science	10												
x_{24} - All other courses completed except Seminary	34												
Sex													
x_{25} - Female	1135									-0.55276	-0.24555	-6.51076	10,107
x_{26} - Male	1492										intercept		12,920



Head of Family							
z_{27} Not Head	1494			-0.58958	-0.29943	-8.84617	9,577
z_{28} Head	1133				intercept		12,989
Religion							
z_{29} Protestant	151				intercept		12,989
z_{30} Jewish	3				intercept		12,989
z_{31} Other	123				intercept		12,989
z_{32} Roman Catholic	2350			-0.02170	0.02900	0.82771	13,300
Race							
z_{33} Black	29				intercept		12,989
z_{34} White	2548			0.10183	0.11192	3.16934	14,450
z_{35} Other	236				intercept		12,989
Children							
z_{36} Has Children	1253			0.39171	0.06225	2.24027	13,790
z_{37} No Children	1374				intercept		12,989
Class of Activity							
z_{38} Agriculture	98			0.04840	-0.08809	-0.98998	11,880
z_{39} Extractive	19			0.04811	0.26686	1.91457	16,871
z_{40} Mfg. Industry	1481			0.08931	0.12673	1.81721	14,665
z_{41} Commerce and Transportation	562			0.19437	0.15642	3.05781	15,187
z_{42} Service Industries	37			-0.02896	-0.27914	-2.77310	9,773
z_{43} Government or Other	370				intercept		12,989
z_{44} Liberal Professions	338			0.15327	-0.09307	-1.59521	11,772
z_{45} Social Services	1144			-0.42440	-0.11196	-2.86288	11,951
Position							
z_{46} Public Employee	1469				intercept		12,989
z_{47} Employer or Own Account	476			-0.29288	0.11953	2.79358	14,589
z_{48} Private Employee	681			0.31868	0.17156	4.72843	15,338
Migration							
z_{49} No Migration	1272			-0.16967	0.00358	0.15817	12,966
z_{50} From Rural	212			-0.02898	-0.00674	-0.16499	12,833
z_{51} From Urban	1142				intercept		12,989
Environment							
z_{52} Urban	2136			0.16744	0.13858	3.70222	14,840
z_{53} Suburban	228			-0.06267	0.03301	0.65085	13,353
z_{54} Rural	243				intercept		12,989
Analysis of Variance							
"F" Value		183.13308	163.44061		101.41797		
R^2 ($\bar{R}^2$)		.32842 (.32709)	.42866 (.42627)		.53959 (.53446)		
Std. Error of Estimate		0.64002	0.59836		0.53900		

TABLE /8

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE (Cont.)

Variable Number and Description	Sample Size	Regression nº 4				Regression nº 5				Regression nº 6			
		Sim. Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log. Inc.	Sim. Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log. Inc.	Sim. Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log. Inc.
Years of University Completed													
z_1 - 1 year	33												
z_2 - 2 years	30												
z_3 - 3 years	115												
z_4 - 4 years	152												
z_5 - 5 years	286												
z_6 - 6 years	88												
Age													
z_7 - 19 years midpoint	93					-0.17613	-1.07150	-14.57493	7,957				
z_8 - 22 " "	726					-0.37959	-0.90795	-21.94819	9,371				
z_9 - 27 " "	690					-0.10243	-0.64562	-15.97305	12,182				
z_{10} - 32 " "	452					0.09608	-0.37268	-8.52232	16,005				
z_{11} - 39 " "	343						Intercept		23,233				
z_{12} - 49 " "	204					0.29072	0.19917	3.67016	28,354				
z_{13} - 59 " "	77					0.13457	0.00667	0.08576	23,389				
z_{14} - 68 " "	22					0.07458	-0.02733	-0.20112	22,607				
Course Completed													
z_{15} - Secondary	2023												
z_{16} - Philosophy	47												
z_{17} - Medicine	88												
z_{18} - Pharmacy	25												
z_{19} - Dentistry	89												
z_{20} - Engineering	81												
z_{21} - Law	222												
z_{22} - Agronomy	28												
z_{23} - Econ./Pol. Science	10												
z_{24} - All other courses completed except Seminary	34												
Sex													
z_{25} - Female	1135												
z_{26} - Male	1492												
Head of Family													
z_{27} - Not Head	1494												
z_{28} - Head	1133												

Religion											
z_{29}- Protestant	151										
z_{30}- Jewish	3										
z_{31}- Other	123										
z_{32}- Roman Catholic	2359										
Race											
z_{33}- Black	89										
z_{34}- White	2361										
z_{35}- Other	234										
Children											
z_{36}- Has Children	1853										
z_{37}- No Children	1374										
Class of Activity											
z_{38}- Agriculture	58	0.04840	-0.05207	-0.51681	15,324	0.04840	-0.13958	-1.59259	28,206		
z_{39}- Extractive	17	0.04811	0.16426	0.92818	19,025	0.04811	0.11358	0.74026	26,088		
z_{40}- Mfg. Industry	101	0.08931	0.04624	0.57734	16,907	0.08931	0.09278	1.33651	25,492		
z_{41}- Commerce and Transportation	562	0.19437	-0.01228	-0.25721	15,946	0.19437	0.04398	1.53978	24,748		
z_{42}- Service Industries	37	-0.02896	-0.49782	-4.04675	9,812	-0.02896	-0.44454	-4.16530	14,895		
z_{43}- Government or Other	370		intercept		16,143		intercept		23,233		
z_{44}- Liberal Professions	338	0.15327	0.00851	0.15864	16,281	0.15327	-0.00902	-0.19405	23,084		
z_{45}- Social Services	1144	-0.42440	-0.68809	-16.12525	8,112	-0.42440	-0.39260	-10.23581	15,689		
Position											
z_{46}- Public Employee	1489										
z_{47}- Employer or Own Account	476										
z_{48}- Private Employee	681										
Migration											
z_{49}- No Migration	1292									-0.16967	-0.30654	-9.69149	10,387
z_{50}- From Rural	212									-0.02898	-0.24550	-4.23029	18,998
z_{51}- From Urban	1142										intercept		14,098
Environment											
z_{52}- Urban	2136										
z_{53}- Suburban	228										
z_{54}- Rural	243										
Analysis of Variance											
"F" Value			85.58058			120.48243				48.10506			
$R^2(\bar{R}^2)$			.18415	(.18429)		.39238	(.38937)			.08537	(.03501)		
Std. Error of Estimate			0.71347			0.61730				0.77608			

TABLE 18

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE (Cont.)

Variable Number and Description	Sample Size	Regression nº 7				Regression nº				Regression nº			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	33												
x_2 - 2 years	30												
x_3 - 3 years	115												
x_4 - 4 years	152												
x_5 - 5 years	256												
x_6 - 6 years	88												
Age													
x_7 - 19 years midpoint	93												
x_8 - 22 " "	726												
x_9 - 27 " "	690												
x_{10} - 32 " "	452												
x_{11} - 39 " "	343												
x_{12} - 49 " "	204												
x_{13} - 59 " "	77												
x_{14} - 68 " "	22												
Course Completed													
x_{15} - Secondary	2023												
x_{16} - Philosophy	47												
x_{17} - Medicine	88												
x_{18} - Pharmacy	25												
x_{19} - Dentistry	89												
x_{20} - Engineering	61												
x_{21} - Law	222												
x_{22} - Agronomy	28												
x_{23} - Econ./Fol. Science	10												
x_{24} - All other courses completed except Seminary	34												
Sex													
x_{25} - Female	1135												
x_{26} - Male	1492												
Head of Family													
x_{27} - Not Head	1494												
x_{28} - Head	1133												

Religion				
x_{29}- Protestant	151			
x_{30}- Jewish	3			
x_{31}- Other	183			
x_{32}- Roman Catholic	2359			
Race				
x_{33}- Black	89			
x_{34}- White	2361			
x_{35}- Other	236			
Children				
x_{36}- Has Children	1553			
x_{37}- No Children	1376			
Class of Activity				
x_{38}- Agriculture	98			
x_{39}- Extractive	17			
x_{40}- Mfg. Industry	168			
x_{41}- Commerce and Transportation .	582			
x_{42}- Service Industries	37			
x_{43}- Government or Other	378			
x_{44}- Liberal Professions	338			
x_{45}- Social Services	1144			
Position				
x_{46}- Public Employee	1469			
x_{47}- Employer or Own Account . . .	496			
x_{48}- Private Employee	681			
Migration				
x_{49}- No Migration	1272			
x_{50}- From Rural	212			
x_{51}- From Urban	1142			
Environment				
x_{52}- Urban	2136	0.16764	0.43905	8.6068 12,699
x_{53}- Suburban	228	-0.06267	0.21511	3.0572 10,119
x_{54}- Rural	263		intercept	8,160
Analysis of Variance				
"F" Value		42.65285		
$R^2(\bar{R}^2)$		.03148 (.03112)		
Std. Error of Estimate . . .		0.77757		

TABLE 19

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	90						intercept		16,431		intercept		20,493
z_4 - 4 years	141					-0.13590	0.23133	2.57328	20,708	-0.13590	0.27657	3.22672	27,077
z_5 - 5 years	285					0.17142	0.53105	6.59161	27,965	0.17142	0.50263	6.48182	33,877
z_6 - 6 years	88					0.16383	0.68200	6.82745	32,498	0.16383	0.58851	6.08624	36,915
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	28	-0.10919	-0.62511	-4.07512	16,274					-0.10919	-0.49974	-3.21147	12,433
z_9 - 27 " "	134	-0.23040	-0.53400	-6.70637	18,187					-0.23040	-0.47816	-6.18601	12,704
z_{10} - 32 " "	133	-0.10455	-0.36947	-4.63108	21,439					-0.10455	-0.34213	-4.44782	14,555
z_{11} - 39 " "	144		intercept		31,022						intercept		20,493
z_{12} - 49 " "	119	0.17723	0.01920	0.23365	31,624					0.17723	0.01763	0.22232	20,858
z_{13} - 59 " "	39	0.04357	-0.11533	-0.96311	27,643					0.04357	-0.09575	-0.82787	18,622
z_{14} - 68 " "	15	-0.00890	-0.27067	-1.50382	23,666					-0.00890	-0.17063	-0.98438	17,278
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	47												
z_{17} - Medicine	88												
z_{18} - Pharmacy	25												
z_{19} - Dentistry	89												
z_{20} - Engineering	61												
z_{21} - Law	222												
z_{22} - Agronomy	28												
z_{23} - Econ./Pol. Science	10												
z_{24} - All other courses completed except Seminary	34												
Sex													
z_{25} - Female	97												
z_{26} - Male	547												

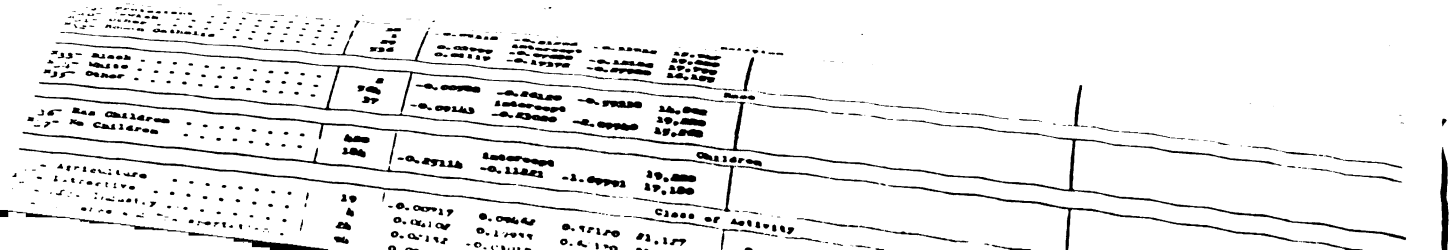
Head of Family				
z_{27}- Not Head	136			
z_{28}- Head	448			
Religion				
z_{29}- Protestant	38			
z_{30}- Jewish	1			
z_{31}- Other	89			
z_{32}- Roman Catholic	536			
Race				
z_{33}- Black	2			
z_{34}- White	564			
z_{35}- Other	37			
Children				
z_{36}- Has Children	420			
z_{37}- No Children	184			
Class of Activity				
z_{38}- Agriculture	19			
z_{39}- Extractive	4			
z_{40}- Mfg. Industry	84			
z_{41}- Commerce and Transportation	94			
z_{42}- Service Industries	1			
z_{43}- Government or Other	145			
z_{44}- Liberal Professions	181			
z_{45}- Social Services	136			
Position				
z_{46}- Public Employee	248			
z_{47}- Employer or Own Account	235			
z_{48}- Private Employee	106			
Migration				
z_{49}- No Migration	225			
z_{50}- From Rural	37			
z_{51}- From Urban	342			
Environment				
z_{52}- Urban	504			
z_{53}- Suburban	31			
z_{54}- Rural	29			
Analysis of Variance				
"F" Value		12.86171	22.74507	15.29047
$R^2(\bar{R}^2)$		.11846 (.10706)	.10211 (.09913)	.13810 (.17719)
Std. Error of Estimate		0.66338	0.66432	0.63680

TABLE 19

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 4				Regression nº 5				Regression nº 6			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	90		intercept		19,220								
x_4 - 4 years	141	-0.13590	0.33282	3.90711	26,810								
x_5 - 5 years	285	0.17142	0.44502	5.70573	29,993								
x_6 - 6 years	88	0.14383	0.60788	6.19489	35,298								
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	20	-0.10919	-0.21731	-1.35836	15,466					-0.10919	-0.61641	-3.91285	17,660
x_9 - 27 " "	134	-0.23040	-0.29640	-3.54135	14,290					-0.23040	-0.53591	-6.74596	19,140
x_{10} - 32 " "	133	-0.10455	-0.23510	-3.06716	15,193					-0.10455	-0.36512	-4.59128	22,705
x_{11} - 39 " "	144		intercept		19,220						intercept		32,711
x_{12} - 49 " "	119	0.17723	-0.00432	-0.05958	19,137					0.17723	0.02541	0.30929	33,553
x_{13} - 59 " "	39	0.04357	-0.14139	-1.25312	16,686					0.04357	-0.13613	-1.13584	28,547
x_{14} - 68 " "	15	-0.00890	-0.18775	-1.10174	15,930					-0.00890	-0.33920	-1.86908	23,301
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	47												
x_{17} - Medicine	88												
x_{18} - Pharmacy	25												
x_{19} - Dentistry	89												
x_{20} - Engineering	61												
x_{21} - Law	222												
x_{22} - Agronomy	28												
x_{23} - Econ./Pol. Science	10												
x_{24} - All other courses completed except Seminary	34												
Sex													
x_{25} - Female	57	-0.30613	-0.30939	-2.94637	14,105								
x_{26} - Male	547		intercept		19,220								
Head of Family													
x_{27} - Not Head	136	-0.34127	-0.21418	-2.64966	15,514								
x_{28} - Head	468		intercept		19,220								



Religion												
x_{29}- Protestant	38	-0.05318	-0.21206	-0.33932	15,547							
x_{30}- Jewish	1		intercept		19,220							
x_{31}- Other	29	0.03999	-0.07680	-0.12126	17,799							
x_{32}- Roman Catholic	536	0.01117	-0.17372	-0.27920	16,155							
Race												
x_{33}- Black	2	-0.00588	-0.26120	-0.99338	14,802							
x_{34}- White	564		intercept		19,220							
x_{35}- Other	37	-0.09143	-0.23020	-2.09940	15,288							
Children												
x_{36}- Has Children	420		intercept		19,220							
x_{37}- No Children	184	-0.25114	-0.11221	-1.69791	17,180							
Class of Activity												
x_{38}- Agriculture	19	-0.00717	0.09462	0.52120	21,127	-0.00717	-0.11782	-0.69270	23,932	-0.00717	-0.04451	-0.27535	31,287
x_{39}- Extractive	4	0.04102	0.19955	0.62370	23,465	0.04102	0.26223	0.74215	34,997	0.04102	0.33551	1.00014	45,752
x_{40}- Mfg. Industry	24	0.02152	-0.03017	-0.19306	18,649	0.02152	-0.01575	-0.10256	26,503	0.02152	0.02877	0.19730	33,666
x_{41}- Commerce and Transportation	94	0.05765	0.01950	0.17218	19,598	0.05765	0.00420	0.04556	27,038	0.05765	0.07771	0.87101	35,354
x_{42}- Service Industries	1	-0.02877	0.30808	0.48950	26,155	-0.02877	-0.58506	-0.83636	14,999	-0.02877	-0.24382	-0.36750	25,633
x_{43}- Government or Other	145		intercept		19,220		intercept		26,924		intercept		32,711
x_{44}- Liberal Professions	181	-0.00160	-0.11168	-0.94551	17,189	-0.00160	-0.09162	-1.17925	24,567	-0.00160	-0.05645	-0.76996	30,915
x_{45}- Social Services	136	-0.13424	-0.13246	-1.54432	16,835	-0.13424	-0.26444	-3.17777	20,668	-0.13424	-0.21943	-2.77708	26,266
Position												
x_{46}- Public Employee	263		intercept		19,220							
x_{47}- Employer or Own Account	235	0.03742	0.09294	0.89438	21,092							
x_{48}- Private Employee	106	-0.00375	0.04398	0.65015	20,490							
Migration												
x_{49}- No Migration	225	-0.05286	0.04392	0.79435	20,083							
x_{50}- From Rural	37	-0.03880	-0.03820	-0.35189	18,499							
x_{51}- From Urban	342		intercept		19,220							
Environment												
x_{52}- Urban	544	0.15768	0.33504	2.67536	26,869							
x_{53}- Suburban	31	-0.11947	0.03310	0.19809	19,967							
x_{54}- Rural	29		intercept		19,220							
Analysis of Variance												
"y" Value			7.46089				2.06828				7.16127	
R^2 ($\bar{R}^2$)			.28089	(.24457)			.02371	(.01340)			.13628	(.11875)
Std. Error of Estimate			0.61019				0.69713				0.69908	

TABLE 19

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 7				Regression nº 8				Regression nº 9			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	90												
x_4 - 4 years	141												
x_5 - 5 years	285												
x_6 - 6 years	88												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	28												
x_9 - 27 " "	134												
x_{10} - 32 " "	133												
x_{11} - 39 " "	144												
x_{12} - 49 " "	119												
x_{13} - 59 " "	39												
x_{14} - 68 " "	15												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	47												
x_{17} - Medicine	88												
x_{18} - Pharmacy	25												
x_{19} - Dentistry	89												
x_{20} - Engineering	61												
x_{21} - Law	222												
x_{22} - Agronomy	28												
x_{23} - Econ./Pol. Science	10												
x_{24} - All other courses completed except Seminary	34												
Sex													
x_{25} - Female	97												
x_{26} - Male	549												
Head of Family													
x_{27} - Not Head	136												
x_{28} - Head	448												

Religion				
x_{25} - Protestant	38			
x_{26} - Jewish	1			
x_{31} - Other	20			
x_{32} - Roman Catholic	536			
Race				
x_{33} - Black	2			
x_{34} - White	593			
x_{35} - Other	37			
Children				
x_{36} - Has Children	489			
x_{37} - No Children	184			
Class of Activity				
x_{38} - Agriculture	19			
x_{39} - Extractive	4			
x_{40} - Mfg. Industry	84			
x_{41} - Commerce and Transportation .	94			
x_{42} - Service Industries	1			
x_{43} - Government or Other	145			
x_{44} - Liberal Professions	121			
x_{45} - Social Services	136			
Position				
x_{46} - Public Employee	268			
x_{47} - Employer or Own Account . . .	235			
x_{48} - Private Employee	186			
Migration				
x_{49} - No Migration	225		-0.05286 -0.09123 -1.51679 23,453 -0.03880 -0.14960 -1.23363 22,124 intercept 25,694	-0.05286 -0.08469 -1.42287 17,376 -0.03880 -0.15348 -1.27916 16,221 intercept 18,912
x_{50} - From Rural	37			
x_{51} - From Urban	342			
Environment				
x_{52} - Urban	504	0.15768 0.34085 2.57620 25,529		0.15768 0.34074 2.57832 26,591
x_{53} - Suburban	31	-0.11947 -0.05635 -0.31441 17,169		-0.11947 -0.05127 -0.28625 17,987
x_{54} - Rural	29	intercept 18,165		intercept 18,912
Analysis of Variance				
"F" Value		7.71282	1.60514	4.62917
R^2 ($\bar{R}^2$)		.02502 (.02341)	.00531 (.00366)	.02998 (.02513)
Std. Error of Estimate . . .		0.69376	0.70073	0.69314

TABLE 19

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 10				Regression nº 11				Regression nº 12			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	90												
x_4 - 4 years	141												
x_5 - 5 years	285												
x_6 - 6 years	88												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	20												
x_9 - 27 " "	134												
x_{10} - 32 " "	133												
x_{11} - 39 " "	144												
x_{12} - 49 " "	119												
x_{13} - 59 " "	39												
x_{14} - 68 " "	15												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	47									-0.16439	-0.21878	-1.47274	16,472
x_{17} - Medicine	88									0.16383	0.46073	3.45707	32,498
x_{18} - Pharmacy	25									-0.13256	-0.26447	-1.52130	15,736
x_{19} - Dentistry	89									-0.20823	-0.16839	-1.26582	17,323
x_{20} - Engineering	41									0.07598	0.34156	2.41864	28,847
x_{21} - Law	222									0.13070	0.30284	2.49211	27,751
x_{22} - Agronomy	28									0.08243	0.31119	1.84803	27,984
x_{23} - Econ./Fol. Science	10									0.05078	0.48940	2.06176	33,443
x_{24} - All other courses completed except Seminary	34										Intercept		20,500
Sex													
x_{25} - Female	57												
x_{26} - Male	547												
Head of Family													
x_{27} - Not Head	136												
x_{28} - Head	468												

Religion				
x_{29}- Protestant	38	-0.07318 -0.49614 -0.69795 21,312		
x_{30}- Jewish	1	intercept 35,088		
x_{31}- Other	29	0.03999 -0.22745 -0.31870 27,881		
x_{32}- Roman Catholic	536	0.01117 -0.34947 -0.49799 24,698		
Race				
x_{33}- Black	2		-0.00508 0.14349 0.32198 22,981	
x_{34}- White	568		0.08618 0.25108 2.18482 25,088	
x_{35}- Other	37		intercept 19,495	
Children				
x_{36}- Has Children	429			
x_{37}- No Children	184			
Class of Activity				
x_{38}- Agriculture	19			
x_{39}- Extractive	4			
x_{40}- Mfg. Industry	84			
x_{41}- Commerce and Transportation	94			
x_{42}- Service Industries	1			
x_{43}- Government or Other	145			
x_{44}- Liberal Professions	181			
x_{45}- Social Services	136			
Position				
x_{46}- Public Employee	268			
x_{47}- Employer or Own Account	235			
x_{48}- Private Employee	106			
Migration				
x_{49}- No Migration	225			
x_{50}- From Rural	37			
x_{51}- From Urban	342			
Environment				
x_{52}- Urban	544			
x_{53}- Suburban	31			
x_{54}- Rural	29			
Analysis of Variance				
"F" Value		0.92586	2.30117	10.80836
R^2 ($\bar{R}^2$)		.00460 (.00130)	.00799 (.00595)	.12683 (.11658)
Std. Error of Estimate		0.70157	0.69993	0.67984

TABLE 19

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 13				Regression nº 14				Regression nº			
		Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	90												
x_4 - 4 years	181												
x_5 - 5 years	285												
x_6 - 6 years	88												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	20	-0.10919	-0.49478	-3.18517	14,849	-0.10919	-0.27201	-1.68095	15,014				
x_9 - 27 " "	134	-0.23040	-0.45320	-5.87125	15,480	-0.23040	-0.28404	-3.38731	14,829				
x_{10} - 32 " "	133	-0.10855	-0.32045	-4.19672	17,497	-0.10855	-0.22313	-2.92285	15,767				
x_{11} - 39 " "	144		Intercept		24,355		Intercept		19,708				
x_{12} - 49 " "	119	0.17723	0.04003	0.50556	25,350	0.17723	0.02096	0.27035	20,126				
x_{13} - 59 " "	39	0.04357	-0.05973	-0.50447	22,943	0.04357	-0.09921	-0.86070	17,847				
x_{14} - 68 " "	15	-0.00890	-0.11389	-0.64761	21,733	-0.00890	-0.11665	-0.67902	17,538				
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	47	-0.16439	-0.09705	-0.67374	22,102	-0.16439	0.09404	0.58068	21,651				
x_{17} - Medicine	88	0.16383	0.39683	3.07896	34,219	0.16383	0.39806	2.88851	29,344				
x_{18} - Pharmacy	25	-0.13256	-0.31107	-1.80400	17,804	-0.13256	-0.31149	-1.78441	14,433				
x_{19} - Dentistry	89	-0.20823	-0.08880	-0.69087	22,285	-0.20823	-0.13714	-0.96568	17,268				
x_{20} - Engineering	61	0.07598	0.37766	2.76616	35,731	0.07598	0.25140	1.85404	25,341				
x_{21} - Law	222	0.13070	0.29787	2.55424	32,806	0.13070	0.21255	2.08845	25,118				
x_{22} - Economy	28	0.04043	0.34671	2.14084	34,441	0.04043	0.27656	1.69950	25,987				
x_{23} - Econ./Pol. Sciences	10	0.05678	0.52455	2.29939	41,153	0.05678	0.39102	1.73164	29,138				
x_{24} - All other courses completed except Seminary	34		Intercept		24,355		Intercept		19,708				
Sex													
x_{25} - Female	37					-0.30413	-0.31370	-2.87553	14,401				
x_{26} - Male	247						Intercept		19,708				
Head of Family													
x_{27} - Not Head	136					-0.34127	-0.16861	-2.08358	16,650				
x_{28} - Head	148						Intercept		19,708				



Religion						
x_{29}- Protestant	38		-0.05318	-0.12176	-0.77628	17,449
x_{30}- Jewish	1			intercept		19,708
x_{31}- Other	29			intercept		19,708
x_{32}- Roman Catholic	536		0.01117	-0.09271	-0.78343	17,943
Race						
x_{33}- Black	2			intercept		19,708
x_{34}- White	568		0.08618	0.20856	1.95182	24,157
x_{35}- Other	37			intercept		19,708
Children						
x_{36}- Has Children	420			intercept		19,708
x_{37}- No Children	184		-0.25114	-0.11343	-1.71943	17,594
Class of Activity						
x_{38}- Agriculture	19		-0.00717	0.05665	0.31145	20,857
x_{39}- Extractive	4			intercept		19,708
x_{40}- Mfg. Industry	84		0.02152	-0.04865	-0.30855	18,772
x_{41}- Commerce and Transportation	94		0.05765	0.01244	0.10983	19,955
x_{42}- Service Industries	1			intercept		19,708
x_{43}- Government or Other	145			intercept		19,708
x_{44}- Liberal Professions	181		-0.00160	-0.07581	-0.69011	18,269
x_{45}- Social Services	136		-0.13424	-0.14463	-1.58598	17,054
Position						
x_{46}- Public Employee	248		-0.03557	-0.10852	-1.20141	17,681
x_{47}- Employer or Own Account	235			intercept		19,708
x_{48}- Private Employee	186			intercept		19,708
Migration						
x_{49}- No Migration	225		-0.05286	0.03524	0.44088	20,415
x_{50}- From Rural	37		-0.03880	-0.05610	-0.51744	18,633
x_{51}- From Urban	342			intercept		19,708
Environment						
x_{52}- Urban	514		0.15768	0.30894	2.42161	26,708
x_{53}- Suburban	31		-0.11947	0.01981	0.11865	20,102
x_{54}- Rural	29			intercept		19,708
Analysis of Variance						
"F" Value		11.01980			7.43437	
R^2 ($\bar{R}^2$)		.20756 (.19011)			.28556 (.24947)	
Std. Error of Estimate		0.43179			0.40821	

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between these two classes. For example, in Espírito Santo, Medicine and Six Years Completed are the same sample. A maximum explained variance of 24.9 percent is obtained when all other variables and Course Completed are used. A maximum of 24.5 percent results when the class "Years Completed" is substituted for Course Completed. It is interesting to note that, in general, persons who completed courses requiring the most years of university earn the most income. Class of Activity alone explains only 1.3 percent of income variance and Age 7.1 percent for a total of 8.4 percent. When regressed jointly, 11.9 percent is explained; hence, there is some interdependence, but the interesting point is the low level of explanation provided by the Class of Activity variables. Within the class, only the income from Social Services is significantly different from the others in the class. This suggests that the markets for university graduates within the state may be competitive. The relatively low income of the Social Services group could reflect psychic income in the field plus the fact that over one-third of this category consists of teachers (Philosophy graduates), whose level of income is low compared to most other university graduates.

Significant income differences appear within the classes of variables. Using Regressions 4 and 14, which include the maximum number of variables, the differences cited below are significant at a level of ninety percent or more. Among university graduates, those completing additional years earn

more than those completing the minimum of three years. Further, each Year Completed is consistent with higher earnings than the year previous. Graduates in Medicine, Engineering, Law, Agronomy, and Economic/Political Sciences earn more than graduates of Philosophy, Pharmacy, Dentistry, and All Other Courses Completed. Among the other variables, women earn less than men, non-Heads of Family less than Heads of Family, non-Whites less than Whites, persons without children less than those with children, and those living in suburban or rural areas less than those living in urban areas. Religion is not significant in explaining income variance nor is position held. Previous migration does not have any significant relation to income variance, nor does Class of Activity, (except Social Services as noted above).

The age-income profile used in the calculations of the rate of return to All University Graduates is prepared from Regression 1 and shown graphically in Figure 20. This profile is presented with a similar one prepared from the data for secondary graduates. The shape is generally an inverted "U" with early earnings rising more rapidly than those of the secondary graduates. Becker points out that this phenomenon is expected, due to recovery of additional educational investment by the university group.[1]

The secondary graduate sub-sample is used to perform nine regressions on different variable classes, and the

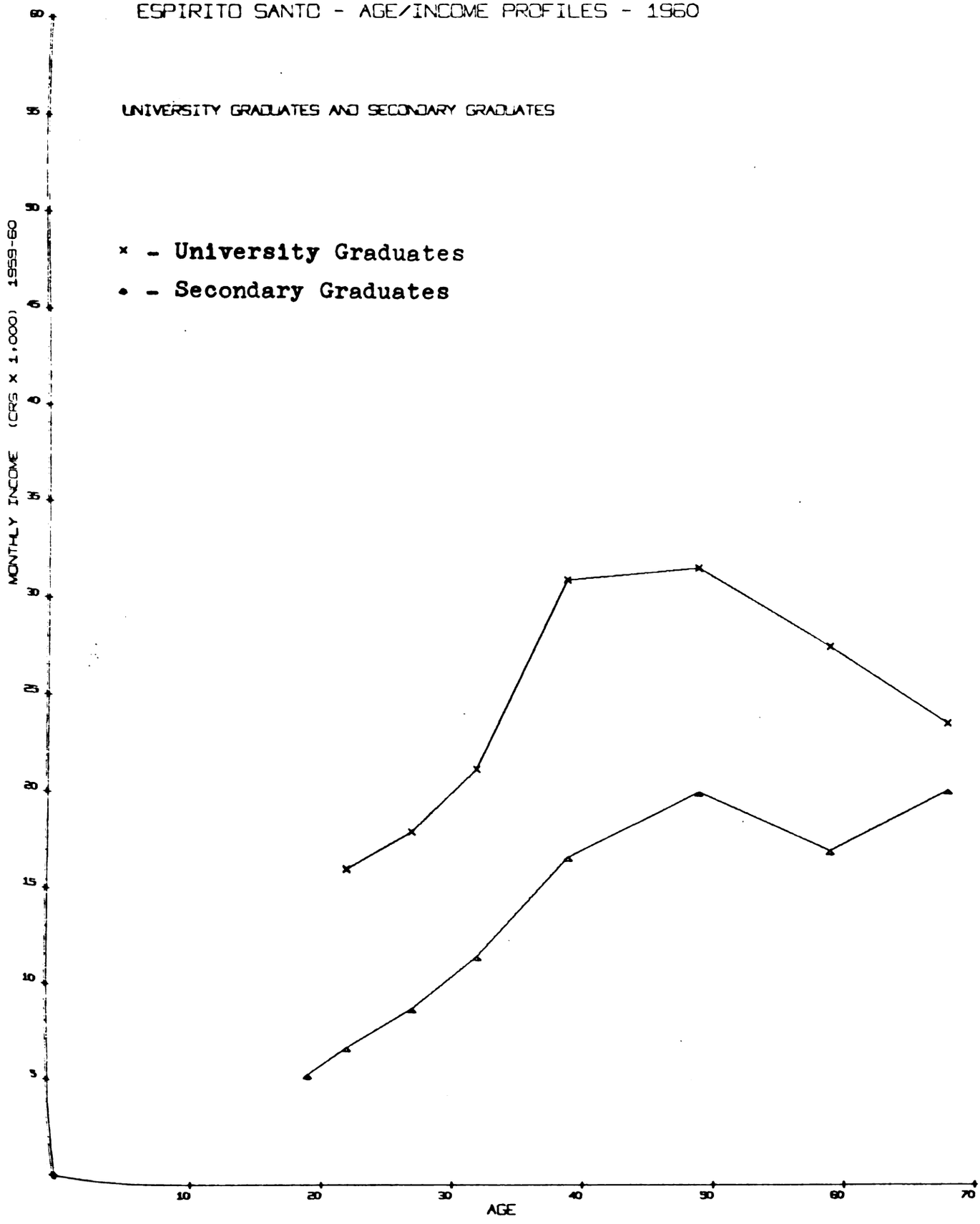
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[1]Gary S. Becker, Human Capital, A Theoretical and Empirical Analysis with Special Reference to Education (New York: National Bureau of Economic Research, 1964), p. 143.



Fig. 20

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960



results are presented in Table 20. This group contains 100 individuals who had completed one or more years of university but had not finished a university course. A regression of log income on Years Completed produces an $\bar{R}^2$ of less than one percent (.0074); however, those completing two or more years of university did earn significantly more than the intercept group consisting of zero or One Year Completed. The low $\bar{R}^2$ is another case of the differential cell sizes affecting total explained variances. There were only 100 persons out of a total sub-sample of 2023 secondary graduates, so even though significant differences in income exist between those with some university training and those with none, the influence on the income variance of the total group is small.

Age variables alone explain twenty-five percent of income variance (more than twice that of the university group), and Class of Activity alone explains twenty percent (compared to one percent for the university group). The two together in the same regression explain only thirty-five percent, indicating a fairly strong interdependence between these two classes. Of more interest is the fact that both Age and Class of Activity have a much greater impact on income variance than at the university level, suggesting that increased education reduces the impact of these variables on income. The influence of other variables follows a similar pattern to that of the university group but generally the influences are of greater magnitude. Women earn less than men, non-Heads of Family less than Heads of Family,

TABLE 20

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF SECONDARY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	33						Intercept		16,782				
z_2 - 2 years	30					0.04004	0.18009	1.07128	20,046				
z_3 - 3 years	25					0.05193	0.23320	1.97252	21,139				
z_4 - 4 years	11					0.06815	0.33052	1.86350	23,300				
z_5 - 5 years	1					0.01480	-0.25574	-0.48568	12,581				
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	93	-0.16505	-1.07814	-14.87109	5,749	-0.16505	-1.06888	-14.75195	5,749				
z_8 - 22 " "	706	-0.31420	-0.85985	-18.97668	7,151	-0.31420	-0.85607	-18.90576	7,112				
z_9 - 27 " "	556	-0.04852	-0.62284	-13.32738	9,064	-0.04852	-0.62172	-13.32243	8,991				
z_{10} - 32 " "	319	0.13250	-0.36236	- 7.04912	11,761	0.13250	-0.36028	-7.01793	11,677				
z_{11} - 39 " "	219		Intercept		16,896		Intercept		16,782				
z_{12} - 49 " "	85	0.23091	0.17433	2.35350	20,156	0.23091	0.17569	2.33726	19,957				
z_{13} - 59 " "	38	0.12068	0.02052	0.19944	17,248	0.12068	0.00881	0.08563	16,890				
z_{14} - 69 " "	7	0.06574	0.18525	0.82371	20,337	0.06574	0.16120	0.71604	19,670				
Course Completed													
z_{15} - Secondary	2023												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	1078												
z_{26} - Male	945												
Head of Family													
z_{27} - Not Head	1358												
z_{28} - Head	665												

Religion				
z_{29}- Protestant	113			
z_{30}- Jewish	2			
z_{31}- Other	91			
z_{32}- Roman Catholic	1814			
Race				
z_{33}- Black	27			
z_{34}- White	1979			
z_{35}- Other	226			
Children				
z_{36}- Has Children	833			
z_{37}- No Children	1190			
Class of Activity				
z_{38}- Agriculture	39			0.05279 0.06046 0.97726 12,338
z_{39}- Extractive	13			0.05952 0.30640 1.77889 15,773
z_{40}- Mfg. Industry	77			0.12643 0.23570 2.95633 14,697
z_{41}- Commerce and Transportation	488			0.32886 0.21124 4.31233 14,362
z_{42}- Service Industries	36			0.00285 -0.17991 -1.65981 9,699
z_{43}- Government or Other	225			intercept 11,611
z_{44}- Liberal Professions	197			0.02490 -0.13618 -2.16879 10,132
z_{45}- Social Services	1008			-0.42774 -0.48464 -10.88699 7,151
Position				
z_{46}- Public Employee	1206			
z_{47}- Employer or Own Account	242			
z_{48}- Private Employee	575			
Migration				
z_{49}- No Migration	1687			
z_{50}- From Rural	175			
z_{51}- From Urban	809			
Environment				
z_{52}- Urban	1192			
z_{53}- Suburban	197			
z_{54}- Rural	234			
Analysis of Variance				
"F" Value		97.5761	63.2138	74.82736
R^2 ($\bar{R}^2$)		.25316 (.25095)	.25693 (.25324)	.20431 (.20396)
Std. Error of Estimate		0.5857	0.5848	0.6083

TABLE 20

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF SECONDARY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 4				Regression nº 5				Regression nº 6			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ine.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ine.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ine.
Years of University Completed													
x_1 - 1 year	33						Intercept		9,457		Intercept		21,106
x_2 - 2 years	30					0.04004	0.23169	1.86776	11,922	0.04004	-0.07337	-0.76088	19,613
x_3 - 3 years	25					0.05193	0.32497	2.39445	13,088	0.05193	0.08761	0.83885	23,039
x_4 - 4 years	11					0.06815	0.59781	2.93219	17,193	0.06815	0.19572	1.24792	25,669
x_5 - 5 years	1					0.01480	0.46114	0.68371	14,997	0.01480	0.02197	0.04215	21,575
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	93	-0.16505	-0.82774	-11.87112	7,402					-0.16505	-0.54613	-7.64371	12,224
x_8 - 22 " "	706	-0.31420	-0.68336	-15.48908	8,552					-0.31420	-0.42688	-8.82019	13,773
x_9 - 27 " "	556	-0.04852	-0.51624	-11.65085	10,107					-0.04852	-0.34700	-7.82157	14,918
x_{10} - 32 " "	319	0.13250	-0.28614	-5.90155	12,722					0.13250	-0.19274	-4.15625	17,406
x_{11} - 39 " "	219		Intercept		16,938						Intercept		21,106
x_{12} - 49 " "	85	0.23091	0.18702	2.67202	20,420					0.23091	0.11076	1.66683	23,579
x_{13} - 59 " "	38	0.12068	0.01707	0.17586	17,228					0.12068	-0.09074	-0.98466	19,275
x_{14} - 68 " "	7	0.06974	0.13144	0.62498	19,316					0.06974	-0.01297	-0.06537	20,834
Course Completed													
x_{15} - Secondary	2023												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	1078									-0.49404	-0.23180	-5.66604	16,739
x_{26} - Male	945										Intercept		21,106
Head of Family													
x_{27} - Not Head	1358									-0.54318	-0.32647	-8.84181	15,227
x_{28} - Head	665										Intercept		21,106

Religion											
z_{29}- Protestant	113							-0.09901	-0.25269	-3.47595	16,398
z_{30}- Jewish	2								intercept		21,106
z_{31}- Other	94								intercept		21,106
z_{32}- Roman Catholic	1814							-0.02701	-0.08044	-1.46913	19,475
Race											
z_{33}- Black	27							-0.05218	-0.12895	-1.28815	18,953
z_{34}- White	1770								intercept		21,106
z_{35}- Other	226							-0.07258	-0.09027	-2.33142	19,284
Children											
z_{36}- Has Children	833							0.34473	0.05319	1.79888	22,259
z_{37}- No Children	1190								intercept		21,106
Class of Activity											
z_{38}- Agriculture	39	0.05279	-0.10066	-1.05008	15,315			0.05279	-0.20881	-1.99628	17,129
z_{39}- Extractive	13	0.05952	0.16988	1.08973	20,073			0.05952	0.26349	1.70586	27,469
z_{40}- Mfg. Industry	77	0.12643	0.21306	2.94321	20,959			0.12643	0.15766	2.00590	24,710
z_{41}- Commerce and Transportation	468	0.32886	0.20086	4.51798	20,704			0.32886	0.18046	3.08343	23,280
z_{42}- Service Industries	36	0.00285	-0.24005	-2.43288	13,322			0.00285	-0.30018	-2.93580	15,483
z_{43}- Government or Other	225		intercept		16,937				intercept		21,106
z_{44}- Liberal Professions	157	0.02490	-0.12917	-2.26484	14,884			0.02490	-0.09684	-1.37261	19,198
z_{45}- Social Services	1008	-0.42774	-0.31382	-7.59919	12,375			-0.42774	-0.11430	-2.56486	18,827
Position											
z_{46}- Public Employee	1206								intercept		21,106
z_{47}- Employer or Own Account	242							0.29116	0.04840	0.81070	22,153
z_{48}- Private Employee	575							0.15252	-0.16064	-3.28302	17,974
Migration											
z_{49}- No Migration	1847							-0.14810	-0.00666	-0.26231	20,966
z_{50}- From Rural	175							-0.00349	-0.00307	-0.07051	21,041
z_{51}- From Urban	800								intercept		21,106
Environment											
z_{52}- Urban	1192								intercept		21,106
z_{53}- Suburban	197								intercept		21,106
z_{54}- Rural	234							-0.13765	-0.09028	-2.37109	19,284
Analysis of Variance											
"F" Value		77.36038				4.48276		50.40837			
R^2 ($\bar{R}^2$)		.35097	(.34617)			.00681	(.00735)	.43158	(.42327)		
Std. Error of Estimate		0.52724				0.97429		0.71396			

TABLE 2.0

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF SECONDARY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 7				Regression nº 8				Regression nº 9			
		Sim.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	33												
x_2 - 2 years	39												
x_3 - 3 years	25												
x_4 - 4 years	11												
x_5 - 5 years	1												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	93												
x_8 - 22 " "	706												
x_9 - 27 " "	556												
x_{10} - 32 " "	319												
x_{11} - 39 " "	219												
x_{12} - 49 " "	85												
x_{13} - 79 " "	38												
x_{14} - 68 "	7												
Course Completed													
x_{15} - Secondary	2023												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	1078												
x_{26} - Male	945												
Head of Family													
x_{27} - Not Head	1398												
x_{28} - Head	665												

Religion				
z_{29}- Protestant	113	-0.05901 -0.47452 -5.08414 8,113		
z_{30}- Jewish	2	intercept 13,640		
z_{31}- Other	94	intercept 13,640		
z_{32}- Roman Catholic	1814	-0.02702 -0.31658 -4.49548 9,502		
Race				
z_{33}- Black	27		-0.03218 -0.20644 -1.57802 7,989	
z_{34}- White	1770		intercept 9,747	
z_{35}- Other	226		-0.07258 -0.16791 -3.13092 8,240	
Children				
z_{36}- Has Children	833			
z_{37}- No Children	1190			
Class of Activity				
z_{38}- Agriculture	39			
z_{39}- Extractive	13			
z_{40}- Mfg. Industry	77			
z_{41}- Commerce and Transportation	468			
z_{42}- Service Industries	36			
z_{43}- Government or Other	225			
z_{44}- Liberal Professions	197			
z_{45}- Social Services	1008			
Position				
z_{46}- Public Employee	1206			
z_{47}- Employer or Own Account	242			
z_{48}- Private Employee	575			
Migration				
z_{49}- No Migration	1067			-0.14810 -0.19598 -6.18244 9,827
z_{50}- From Rural	175			-0.00349 -0.10933 -1.96342 9,844
z_{51}- From Urban	800			intercept 10,982
Environment				
z_{52}- Urban	1192			intercept 10,982
z_{53}- Suburban	197			intercept 10,982
z_{54}- Rural	234			-0.13765 -0.23939 -5.09597 8,624
Analysis of Variance				
"F" Value		13.67111	6.60062	25.98849
R^2 ($\bar{R}^2$)		.01335 (.01287)	.00249 (.00501)	.03718 (.03623)
Std. Error of Estimate		0.07241	0.07474	0.60249

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those with no children less than those with children, and non-whites less than Whites (although the difference is smaller than in the case of university graduates). Unlike the university group, Protestants have significantly lower earnings than non-Protestants (mostly Roman Catholic). Those in Agriculture, Government, Liberal Professions, and Social Services earn less than those in Extractive and Manufacturing Industries or Commerce and Transportation. Private Employees earn less than those working as a Public Employee, Employer, or for their Own Account. Migration background has no significant influence, but again, those in rural environments earn less than those in suburban or urban locations.

The age-income profile for secondary graduates in Figure 20 shows a decline in income from Age 49 to Age 59 and then an increase from Age 59 to Age 69. The significance of the regression coefficients for these two cells is low but this may be the result of their proximate value to the intercept term. Only thirty-eight and seven persons respectively are in the Age 59 and Age 69 cells, which may also cause this anomaly. Another possible explanation could be that a large number of persons may begin their retirement in their fifties but those in better paying positions continue their working to a later age. The profile for the secondary graduates is repeated in the profiles for each university subsample studied to give a constant alternative income reference.

The separation of
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ocial Services

The separation of university graduates into Course Completed sub-samples reduces observations to a point that impairs the significance level of some of the subsequent regressions. The computed t values for many of the regression coefficients are also very low.

Philosophy.--Three regressions were made with the sample of Philosophy graduates, as shown in Table 21. The regression on Age alone has an F value of only .7989, which indicates almost no significance for the overall regression. As pointed out previously, this does not mean that the age-income profile (Figure 21) prepared from these results is not significant. Graduation from a course in Philosophy was possible after either three or four years of study, depending on the school attended and specific course taken. When Years Completed is added to the regression a significant increase in income is shown to exist for those completing the fourth year compared to those completing only three. The significance of this regression exceeds the seventy-five percent level. When all variables are added to the regression, the significance barely remains at the seventy-five percent level, and none of the regression coefficients has significance levels in excess of eighty percent. Variables with significance between fifty and eighty percent are as follows: Four Years Completed have higher income than Three Years Completed, Females have higher income than Males, Heads of Family more than non-Heads of Family, Jew more than Protestant or Roman Catholic, Government and Commerce/Transportation more than Social Services, and Urban more than Suburban.

TABLE XI

STATE OF ESPÍRITO SANTO

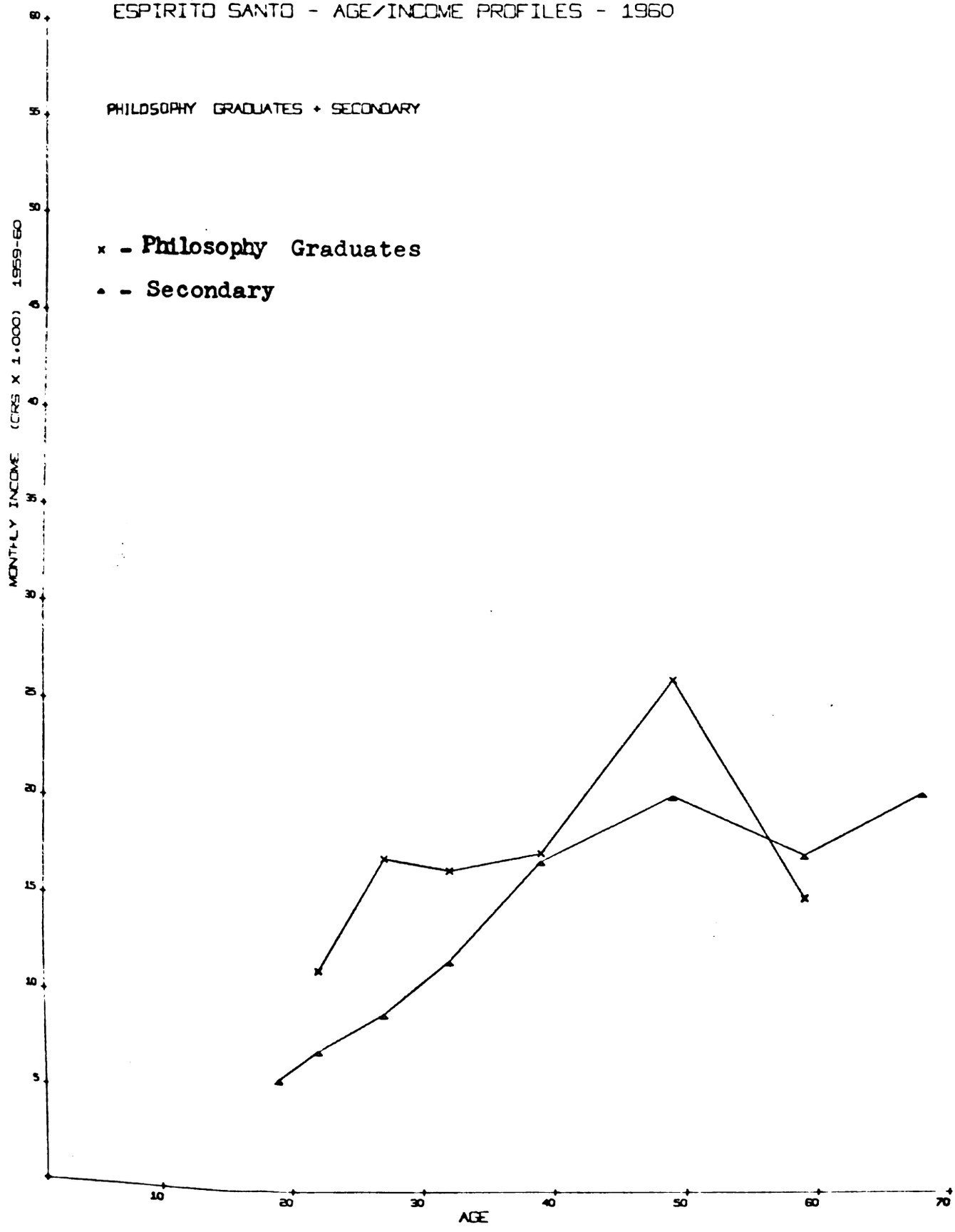
REGRESSIONS OF LOG INCOME FROM SAMPLE OF PHILOSOPHY

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	11												
x_4 - 4 years	36												
x_5 - 5 years	0												
x_6 - 6 years	0												
							intercept		12,135		intercept		11,243
						0.35069	0.29537	2.06319	20,408	0.35069	0.16651	1.13896	16,289
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	7	-0.23627	-0.42898	-1.22915	11,311	-0.23627	-0.37780	-1.13260	8,523	-0.23627	-0 14930	-0.32667	9,701
x_9 - 27 " "	16	0.03683	-0.01690	-0.05771	17,018	0.03683	-0.11970	-0.42803	11,032	0.03683	0.04870	0.11564	11,825
x_{10} 32 " "	10	-0.00568	-0.05439	-0.17890	16,353	-0.00568	-0.07690	-0.24021	11,561	-0.00568	0.09593	0.26230	12,397
x_{11} 39 " "	9		intercept		17,301		intercept		12,135		intercept		11,243
x_{12} 49 " "	4	0.20858	0.41003	0.99654	26,071	0.20858	0.24691	0.60499	15,886	0.20858	0.59260	1.20201	20,373
x_{13} 59 " "	1	-0.02057	-0.14274	-0.19737	15,000	-0.02057	-0.30786	-0.43939	9,140	-0.02057	0.03517	0.04689	11,670
x_{14} 68 " "	0												
Course Completed													
x_{15} Secondary	0												
x_{16} Philosophy	47												
x_{17} Medicine	0												
x_{18} Pharmacy	0												
x_{19} Dentistry	0												
x_{20} Engineering	0												
x_{21} Law	0												
x_{22} Agronomy	0												
x_{23} Econ./Pol. Science	0												
x_{24} All other courses completed except Seminary	0												
Sex													
x_{25} Female	23									0.21460	0.26158	0.71588	14,631
x_{26} Male	24										intercept		11,243
Head of Family													
x_{27} Not Head	23									-0.32672	-0.22758	-0.70208	8,971
x_{28} Head	24										intercept		11,243

Religion							
z_{29}- Protestant	13			-0.01871	-0.20048	-0.61351	9,219
z_{30}- Jewish	1			0.16932	0.68228	0.89353	22,888
z_{31}- Other	0						
z_{32}- Roman Catholic	33				intercept		11,248
Race							
z_{33}- Black	1			0.16932	0.40693	0.71091	16,989
z_{34}- White	45				intercept		11,248
z_{35}- Other	1			-0.15844	-0.26199	-0.30982	8,667
Children							
z_{36}- Has Children	25			0.18768	-0.13198	-0.40895	9,871
z_{37}- No Children	22				intercept		11,248
Class of Activity							
z_{38}- Agriculture	1			0.41704	1.38608	0.00544	45,048
z_{39}- Extractive	0						
z_{40}- Mfg. Industry	0						
z_{41}- Commerce and Transportation	1			-0.02037	0.70798	0.90038	22,848
z_{42}- Service Industries	0						
z_{43}- Government or Other	1			-0.15844	-0.62850	-0.82206	6,088
z_{44}- Liberal Professions	0						
z_{45}- Social Services	44				intercept		11,248
Position							
z_{46}- Public Employee	24			-0.00565	-0.06848	-0.00026	10,516
z_{47}- Employer or Own Account	1				intercept		11,248
z_{48}- Private Employee	22			-0.11494	-0.39126	-0.00153	9,616
Migration							
z_{49}- No Migration	19			-0.08459	-0.01759	-0.06042	11,087
z_{50}- From Rural	5			0.17914	0.03408	0.08477	11,877
z_{51}- From Urban	23				intercept		11,248
Environment							
z_{52}- Urban	44			0.18275	0.33079	0.72160	15,879
z_{53}- Suburban	3				intercept		11,248
z_{54}- Rural	0						
Analysis of Variance							
"F" Value		0.79890	1.42809		1.11228		
R^2 ($\bar{R}^2$)		.08977 (.00200)	.17642 (.07599)		.12301 (.08533)		
Std. Error of Estimate		0.68607	0.66035		0.66178		

Fig. 21

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960



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Medicine.--Both of the regressions performed on the graduates of Medicine sample have overall significance of greater than ninety percent. The results and the age-income profile for this group are presented in Table 22 and Figure 22 respectively. Heads of families and those who had no migration history earn more than their counterparts at a significance level over ninety-five percent. In the significance range of fifty to eighty percent, the following income differences occur: women earn more than men, Heads of Family more than non-Heads of Family, Protestants more than Roman Catholics and more than "Other Religions," those with children more than those without, those who are Self-Employed more than Public or Private Employees, and those in urban environment more than suburban or rural.

The shape of the age-income profile for Medicine indicates a trend toward reduced earnings at an early age relative to many other professions. Interviews in Espírito Santo confirm this as being typical of medical graduates. After completing their training, many doctors practice for a short time before becoming involved in more lucrative ventures such as real estate, banking, or farming. The Director of the Faculty of Medicine of the Federal University of Espírito Santo indicated this phenomenon is a serious problem in the area.[2] It was his opinion that there was no serious

[2] Interview with the Diretor da Faculdade de Medicina, Universidade Federal do Espírito Santo, January 24, 1968.

TABLE 2.2

STATE OF ESPÍRITO SANTO

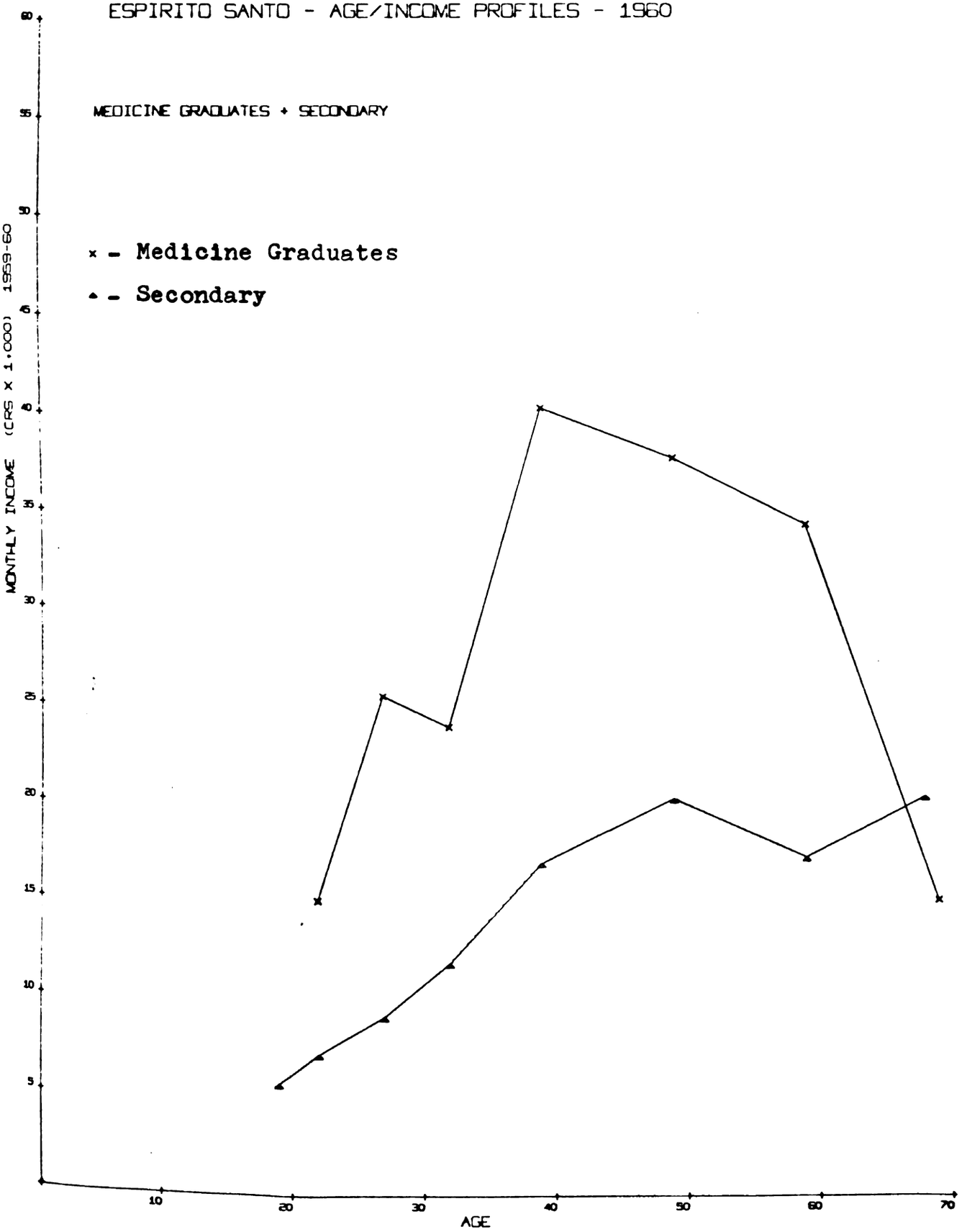
REGRESSIONS OF LOG INCOME FROM SAMPLE OF MEDICINE

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Reg.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Reg.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Reg.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	0												
x_6 - 6 years	88												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	1	-0.11862	-0.98172	-1.48395	15,000	-0.11862	-0.40193	-0.55270	7,486				
x_9 - 27 " "	8	-0.11025	-0.45716	-1.59868	25,472	-0.11025	0.28697	0.65689	18,909				
x_{10} 32 " "	18	-0.22401	-0.57023	-2.36346	23,868	-0.22401	-0.26215	-1.02576	8,609				
x_{11} 39 " "	21		Intercept		40,155		Intercept		11,190				
x_{12} 49 " "	28	0.14129	-0.06697	-0.33854	37,554	0.14129	0.06714	0.32566	11,971				
x_{13} 59 " "	11	0.02769	-0.16030	-0.62850	34,208	0.02769	0.16171	0.69972	13,154				
x_{14} 68 " "	1	-0.11862	-0.98172	-1.48395	15,000	-0.11862	-0.67844	-0.98042	5,678				
Course Completed													
x_{15} Secondary	0												
x_{16} Philosophy	0												
x_{17} Medicine	88												
x_{18} Pharmacy	0												
x_{19} Dentistry	0												
x_{20} Engineering	0												
x_{21} Law	0												
x_{22} Agronomy	0												
x_{23} Econ./Pol. Science	0												
x_{24} All other courses completed except Seminary	0												
Sex													
x_{25} Female	2					0.01616	0.68811	1.11128	22,248				
x_{26} Male	86						Intercept		11,190				
Head of Family													
x_{27} Not Head	13					-0.28528	-0.61186	-2.01303	5,949				
x_{28} Head	75						Intercept		11,190				

Religion						
z_{29}- Protestant	3		0.01991	0.37992	0.84867	16,362
z_{30}- Jewish	0					
z_{31}- Other	4		-0.04300	-0.35936	-0.93253	9,812
z_{32}- Roman Catholic	81			intercept		11,190
Race						
z_{33}- Black	0					
z_{34}- White	81		0.01975	0.17956	0.60582	13,391
z_{35}- Other	6			intercept		11,190
Children						
z_{36}- Has Children	64		0.26739	0.27690	1.19288	14,754
z_{37}- No Children	24			intercept		11,190
Class of Activity						
z_{38}- Agriculture	0					
z_{39}- Extractive	0					
z_{40}- Mfg. Industry	0					
z_{41}- Commerce and Transportation	1		0.01136	-0.43842	-0.53078	9,218
z_{42}- Service Industries	0					
z_{43}- Government or Other	5			intercept		11,190
z_{44}- Liberal Professions	40		0.14584	-0.50590	-1.11252	6,787
z_{45}- Social Services	42		-0.13228	-0.00208	-0.00615	11,187
Position						
z_{46}- Public Employee	42		-0.23442	-0.17556	-0.31109	9,388
z_{47}- Employer or Own Account	44		0.22936	0.56607	1.00142	19,709
z_{48}- Private Employee	2			intercept		11,190
Migration						
z_{49}- No Migration	28		0.12326	0.44348	2.56416	17,435
z_{50}- From Rural	2		0.04866	-0.07312	-0.13409	10,402
z_{51}- From Urban	58			intercept		11,190
Environment						
z_{52}- Urban	85		0.13193	0.69302	0.90830	22,377
z_{53}- Suburban	2		-0.07628	0.30407	0.33312	15,167
z_{54}- Rural	1			intercept		11,190
Analysis of Variance						
"F" Value		1.75311		1.48856		
R^2 ($\bar{R}^2$)		.11493 (.06097)		.32140 (.11584)		
Std. Error of Estimate		0.68526		0.66273		

Fig. 22

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960



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shortage of doctors in the state but that there was, rather, a shortage of practicing doctors, as well as a shortage in the rural areas. The age-income profile gives support to his first point and the environmental income difference in Regression 2 points out one possible cause for his second observation.

Pharmacy.--The significance levels of the regressions performed on the sample of Pharmacy graduates is so low that meaningful interpretation of the results is not possible. The low income levels were confirmed by interview as being typical of the period, but beyond this, the population and sample are too small to examine the variables using the multiple regression technique. The regressions and age-income profile for this sample are given in Table 23 and Figure 23.

Dentistry.--The regressions computed for the sample of graduates of Dentistry are all significant above the ninety-five percent level (See Table 24 and Figure 24). The population contains graduates with both three and four Years Completed, and the four-year graduates earn higher levels of income at a level of significance of ninety-eight per-cent. The following characteristics are consistent with different levels of income at a ninety percent significance level or more: "Other Religions" has higher earnings than Protestant or Roman Catholic, White higher than non-white, those with children higher than those without, and those with urban environments higher than suburban or rural. Significant

TABLE 23

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF PHARMACY

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	17						intercept		15,365		intercept		26,270
x_4 - 4 years	8					-0.02170	-0.02805	-0.05855	15,000	-0.02170	-0.63386	-0.57048	13,937
x_5 - 5 years	0												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	0												
x_9 - 27 " "	2	0.02769	0.10934	0.12052	16,733	0.02788	0.08528	0.08271	16,733	0.02769	1.21868	0.00250	88,847
x_{10} 32 " "	5	-0.00326	0.04373	0.05390	15,671	-0.00326	0.03892	0.04643	15,975	-0.00326	0.98431	0.00405	70,438
x_{11} 39 " "	1		intercept		15,000		intercept		15,365		intercept		26,270
x_{12} 49 " "	6	0.02182	0.07289	0.09110	16,134	0.02182	0.06881	0.05236	16,134	0.02182	0.17985	0.00049	31,446
x_{13} 59 " "	7	0.08428	0.13627	0.17207	17,190	0.08428	0.11908	0.13650	17,308	0.08428	0.70125	0.00192	52,968
x_{14} 68 " "	4	-0.13709	-0.15715	-0.18974	12,816	-0.13709	-0.17519	-0.19191	12,896	-0.13709	0.44166	0.00120	40,857
Course Completed													
x_{15} Secondary	0												
x_{16} Philosophy	0												
x_{17} Medicine	0												
x_{18} Pharmacy	25												
x_{19} Dentistry	0												
x_{20} Engineering	0												
x_{21} Law	0												
x_{22} Agronomy	0												
x_{23} Econ./Pol. Science	0												
x_{24} All other courses completed except Seminary	0												
Sex													
x_{25} Female	5									-0.42176	-0.87886	-0.54378	10,907
x_{26} Male	20										intercept		26,270
Head of Family													
x_{27} Not Head	8									-0.19806	-0.83991	-0.52880	11,342
x_{28} Head	17										intercept		26,270

Religion							
z_{29}- Protestant	4			0.25105	0.74911	0.56004	57,548
z_{30}- Jewish	0						
z_{31}- Other	2			0.02769	0.59702	0.36959	49,785
z_{32}- Roman Catholic	19				intercept		26,270
Race							
z_{33}- Black	0						
z_{34}- White	24				intercept		26,270
z_{35}- Other	1			-0.01500	0.26983	0.00006	34,270
Children							
z_{36}- Has Children	18			-0.12940	1.40327	0.69327	186,879
z_{37}- No Children	7				intercept		26,270
Class of Activity							
z_{38}- Agriculture	1			-0.01500	-2.49508	-0.02247	2,187
z_{39}- Extractive	0						
z_{40}- Mfg. Industry	1			-0.01500	-3.05203	-0.00074	1,262
z_{41}- Commerce and Transportation	16			-0.08089	-1.71627	-0.31970	4,702
z_{42}- Service Industries	0						
z_{43}- Government or Other	1				intercept		26,270
z_{44}- Liberal Professions	2			0.16961	-0.22965	-0.00094	20,880
z_{45}- Social Services	4			-0.13709	-1.33253	-0.01094	6,930
Position							
z_{46}- Public Employee	4				intercept		26,270
z_{47}- Employer or Own Account	19			-0.02142	-0.57693	-0.16614	14,778
z_{48}- Private Employee	2			0.02769	-1.24228	-0.38531	7,585
Migration							
z_{49}- No Migration	8			-0.07552	1.06316	0.00873	76,685
z_{50}- From Rural	1				intercept		26,270
z_{51}- From Urban	16				intercept		26,270
Environment							
z_{52}- Urban	22			0.14562	0.10340	0.00062	29,132
z_{53}- Suburban	0						
z_{54}- Rural	3				intercept		26,270
Analysis of Variance							
"F" Value		0.08620		0.08856		0.14092	
$R^2(\bar{R}^2)$		.02218	(<0)	.02234	(<0)	.49499	(<0)
Std. Error of Estimate		0.74078		0.74102		1.33748	

Fig. 23

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960

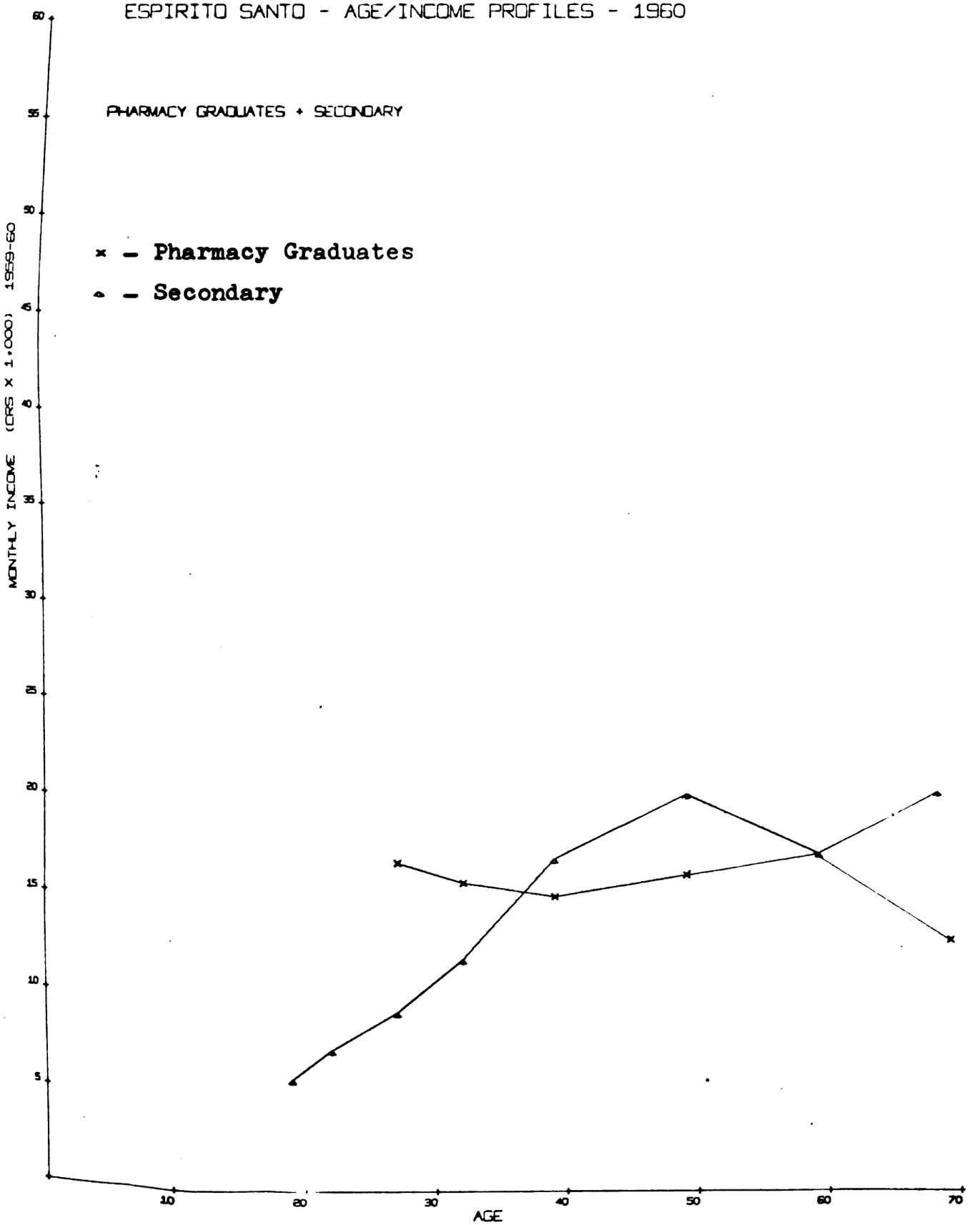


TABLE 2.4

STATE OF ESPÍRITO SANTO

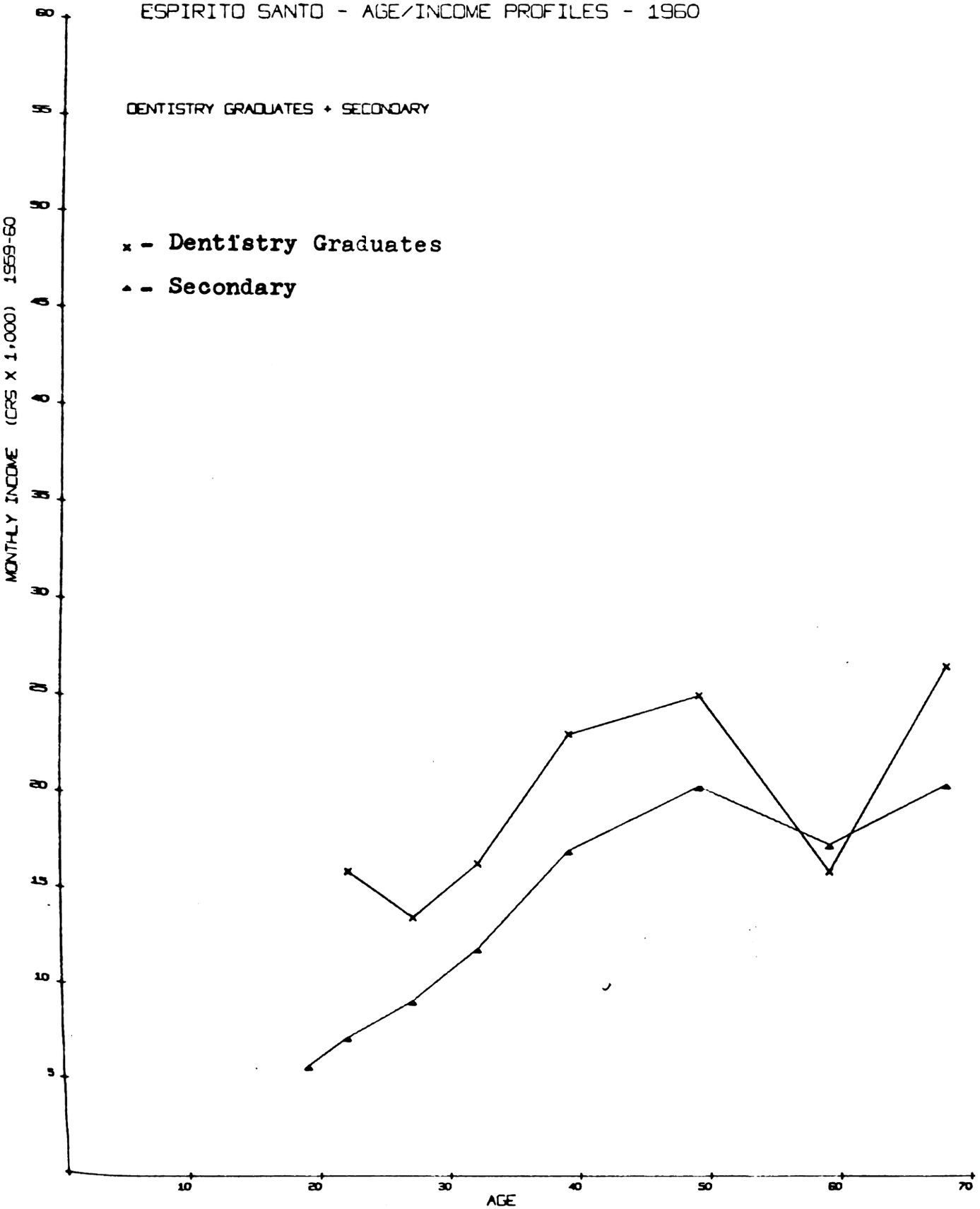
REGRESSIONS OF LOG INCOME FROM SAMPLE OF DENTISTRY

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	44						intercept		21,029		intercept		19,739
z_4 - 4 years	45					0.19147	0.25737	1.93791	27,201	0.19147	0.33393	2.34356	27,564
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	4	-0.02995	-0.36897	-1.02855	15,843	-0.02995	-0.47621	-1.33332	13,062	-0.02995	-0.27410	-0.70894	15,007
z_9 - 27 " "	11	-0.29089	-0.53721	-2.52306	13,389	-0.29089	-0.58426	-2.79286	11,724	-0.29089	-0.46615	-1.98550	12,384
z_{10} - 32 " "	20	-0.05662	-0.34767	-1.53239	16,184	-0.05662	-0.39056	-1.74160	14,230	-0.05662	-0.39620	-1.52777	13,282
z_{11} - 39 " "	12		intercept		22,912		intercept		21,029		intercept		19,739
z_{12} - 49 " "	15	0.25250	0.08361	0.34745	24,911	0.25250	0.01497	0.06258	21,346	0.25250	-0.22047	-0.82117	15,833
z_{13} - 59 " "	4	-0.02995	-0.36897	-1.02855	15,843	-0.02995	-0.34752	-0.98442	14,855	-0.02995	-0.53026	-1.54099	11,615
z_{14} - 68 " "	3	0.12136	0.14121	0.35209	26,388	0.12136	0.05542	0.13961	22,227	0.12136	-0.18485	-0.48275	16,407
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	89												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	5									-0.22813	-0.19755	-0.63599	16,200
z_{26} - Male	84										intercept		19,739
Head of Family													
z_{27} - Not Head	29									-0.28908	-0.17446	-0.91614	16,579
z_{28} - Head	60										intercept		19,739

Religion						
z_{29}- Protestant	5			-0.11691	-0.08925	-0.31178	18,493
z_{30}- Jewish	0						
z_{31}- Other	7			0.28187	0.42195	1.03721	30,089
z_{32}- Roman Catholic	77				intercept		19,739
Race						
z_{33}- Black	0				intercept		19,739
z_{34}- White	82			-0.18625	-0.42581	-1.62652	12,894
z_{35}- Other	7						
Children						
z_{36}- Has Children	53			0.35229	0.38776	2.15316	28,513
z_{37}- No Children	36				intercept		19,739
Class of Activity						
z_{38}- Agriculture	3			-0.02053	-0.79087	-1.28996	8,955
z_{39}- Extractive	1			0.11576	-0.03665	-0.04614	19,088
z_{40}- Mfg. Industry	0						
z_{41}- Commerce and Transportation	5			0.00956	-0.32450	-0.65174	14,269
z_{42}- Service Industries	0				intercept		19,739
z_{43}- Government or Other	3			0.05261	-0.60593	-1.16901	10,769
z_{44}- Liberal Professions	68			-0.18223	-0.53949	-1.32130	11,589
z_{45}- Social Services	9						
Position						
z_{46}- Public Employee	11				intercept		19,739
z_{47}- Employer or Own Account	78			0.11407	0.09799	0.24053	21,771
z_{48}- Private Employee	7			-0.15910	-0.19899	-0.49875	16,183
Migration						
z_{49}- No Migration	41			0.05708	-0.05061	-0.36606	18,765
z_{50}- From Rural	5			-0.21165	-0.22704	-0.76924	15,717
z_{51}- From Urban	43				intercept		19,739
Environment						
z_{52}- Urban	75			0.21496	0.49085	1.73670	32,267
z_{53}- Suburban	7			-0.17215	0.12397	0.31723	22,344
z_{54}- Rural	7				intercept		19,739
Analysis of Variance						
"F" Value		2.44440	2.70211		2.48485	
R^2 ($\bar{R}^2$)		.15172 (.10062)	.18930 (.12999)		.16234 (.29919)	
Std. Error of Estimate		0.62133	0.61115		0.59860	

Fig. 24

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960



at levels between fifty and eighty percent are the following: Heads of Family higher than non-Heads of Family, those working in government higher than those not in government, and those migrating from an urban area higher than those that migrated from a rural area.

Interviews with three members of the Faculdade de Odontologia at the Universidade Federal do Espírito Santo produce the following opinions: (1) At present, dentists earn as much as doctors. (2) In 1960, doctors earned much more than dentists. (3) After assuring me that dentistry is a "profession" and as such, dentists were not motivated by money, they unanimously agreed that dentists were and are leaving the profession because they are unable to earn enough money. (4) The three-year dentistry course has been eliminated, and in many states the specialty courses extend up to six years. Younger and more highly trained dentists are able to command much higher fees than was the case ten years ago. All agreed that there would be a tendency to understate incomes in a census report, but largely income from non-labor sources. There was general agreement that the 1960 age-income profile was reasonable, but that the current situation would produce a profile very similar to that of doctors, both in shape and level.

Engineering.--The regression of log income on all variables for the sub-sample of Engineering graduates is significant at the ninety percent level. Table 25 and Figure 25 give the results for this group. Very few of the

TABLE X.5

STATE OF ESPÍRITO SANTO

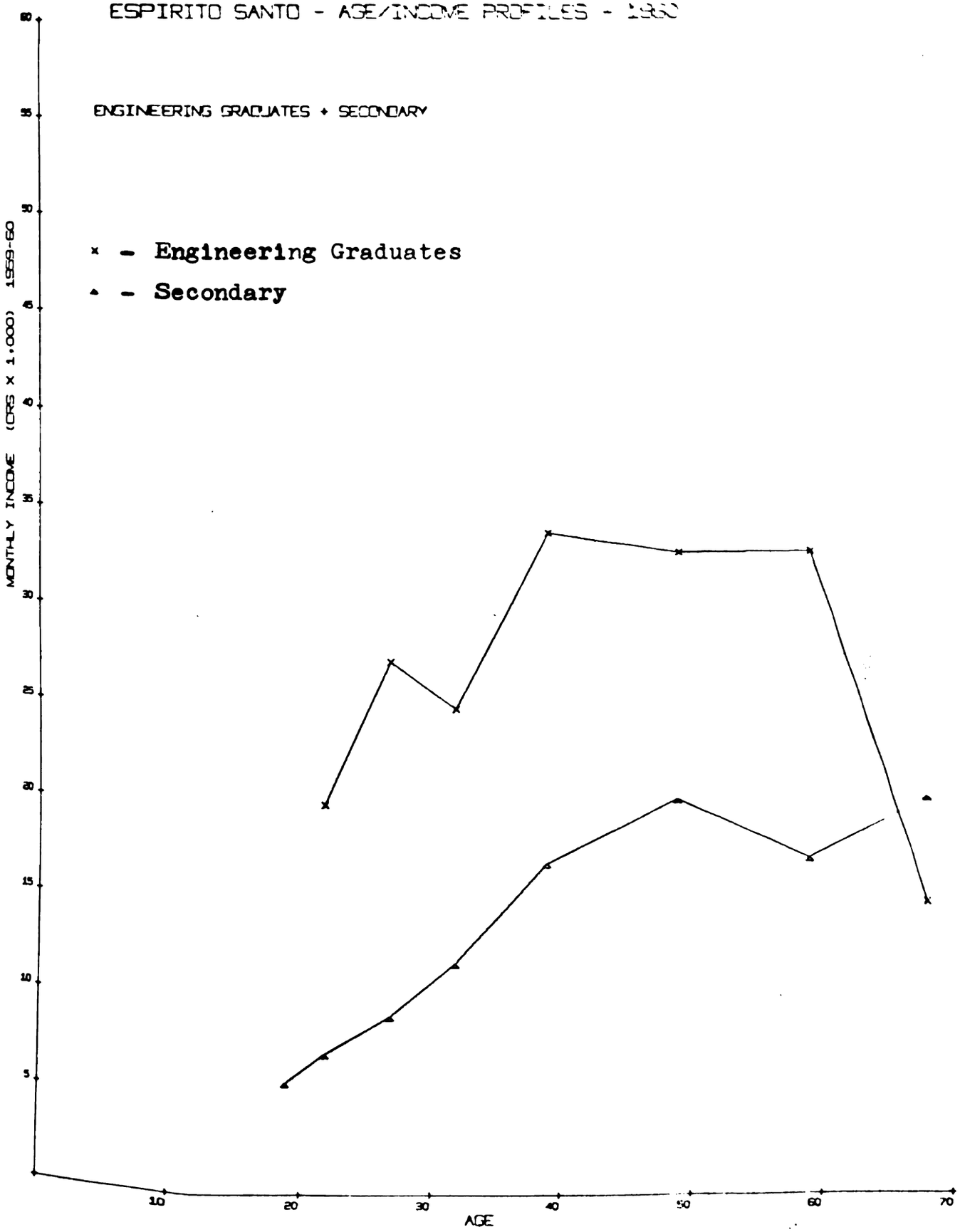
REGRESSIONS OF LOG INCOME FROM SAMPLE OF ENGINEERING

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	61												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	3	-0.15444	-0.53052	-1.5268	19,895	-0.15444	-0.06113	-0.13668	12,841				
x_9 - 27 " "	16	-0.06304	-0.21676	-1.11005	27,227	-0.06304	0.01730	0.06349	13,888				
x_{10} - 32 " "	11	-0.13038	-0.31103	-1.43773	24,778	-0.13038	-0.22243	-0.73931	10,926				
x_{11} - 39 " "	16		Intercept		33,818		Intercept		13,650				
x_{12} - 49 " "	5	0.06940	-0.03181	-0.11241	32,759	0.06940	0.15000	0.49977	15,899				
x_{13} - 59 " "	9	0.10050	-0.02670	-0.11605	32,927	0.10050	-0.25982	-0.82397	11,066				
x_{14} - 68 " "	1	-0.15430	-0.81295	-1.82791	15,000	-0.15430	1.16834	1.30897	83,908				
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	61												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	0												
x_{26} - Male	61												
Head of Family													
x_{27} - Not Head	11					0.00782	-0.01221	-0.09085	13,484				
x_{28} - Head	50						Intercept		13,650				

Religion						
z_{29}- Protestant	1		0.04599	0.39883	0.60953	20,360
z_{30}- Jewish	0					
z_{31}- Other	3		-0.09706	0.11981	0.27348	15,286
z_{32}- Roman Catholic	57			intercept		13,690
Race						
z_{33}- Black	0					
z_{34}- White	59			intercept		13,690
z_{35}- Other	2		-0.32580	-1.39991	-1.89588	3,382
Children						
z_{36}- Has Children	45		0.33667	0.27936	1.28425	18,040
z_{37}- No Children	16			intercept		13,690
Class of Activity						
z_{38}- Agriculture	1		0.31575	1.78960	2.69682	81,984
z_{39}- Extractive	3		0.08031	0.21190	0.52978	16,872
z_{40}- Mfg. Industry	12		-0.11154	0.10772	0.38806	15,268
z_{41}- Commerce and Transportation	16		0.07264	0.14906	0.48202	15,844
z_{42}- Service Industries	0					
z_{43}- Government or Other	19			intercept		13,690
z_{44}- Liberal Professions	10		0.08781	0.19908	0.57906	16,096
z_{45}- Social Services	2		0.06502	0.27998	0.64351	18,048
Position						
z_{46}- Public Employee	25			intercept		13,690
z_{47}- Employer or Own Account	12		-0.04172	-0.08606	-0.27698	12,524
z_{48}- Private Employee	24		0.30269	0.25269	1.05304	17,574
Migration						
z_{49}- No Migration	29		-0.28725	-0.11275	-0.43589	12,195
z_{50}- From Rural	0					
z_{51}- From Urban	41			intercept		13,690
Environment						
z_{52}- Urban	56		0.14819	0.43861	0.96631	21,165
z_{53}- Suburban	3		-0.12414	0.53261	0.85464	23,251
z_{54}- Rural	2			intercept		13,690
Analysis of Variance						
"F" Value		0.97916		1.47238		
R^2 ($\bar{R}^2$)		.09812 (.01614)		.46016 (.16948)		
Std. Error of Estimate		0.55233		0.50939		

Fig. 25

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960



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variables explain significant portions of income variance, and the standard error of estimate for this regression is lower than for any other sub-sample. This would indicate a fairly homogeneous market for engineers that is less affected by non-income factors than is the case in markets for other professionals. One engineer in agriculture earns significantly more than engineers in all other fields, and the two non-white engineers earn substantially less than their white cohorts. With these two exceptions, earnings are nearly uniform.

The age-income profile indicates a longer high income working lifetime for engineers than is the case for all other graduates except lawyers. An interview with the engineering representative on the Comissão de Planejamento of the Universidade Federal de Espírito Santo supported this characteristic. This individual also had earnings data for engineers in the state going back to 1960 which agreed very closely with the Census data.

Law.--The level of significance for the regression using Law graduates as a sample is greater than 99.9 percent. Women earn less than men at a level of significance of ninety-nine percent. Whites earn more than non-whites, but at a significance level of between fifty to eighty percent, as is the case for the following: Heads of Family have more income than non-Heads of Family, persons in Services Industries and Liberal Professions more than those in other

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Classes of Activity, migrants from urban areas more than migrants from urual areas, and persons in urban environments more than suburbanites. Table 26 details these results.

The age-income profile of lawyers shows a continuous rise, with the exception of Age 22 to Age 27. The Age 22 cell represents only one person, which is probably either a reporting error or a most exceptional case. A discussion with the Vice-President of the State Bar Association (Ordem dos Advogados do Brasil - Espírito Santo) indicates that the profile was and is typical for the area.

Agronomy.--The small size of the Agronomy graduates sub-sample reduces the level of significance of the all-variable regression to the seventy-five percent level (see Table 27). Regression coefficients in the significance range of eighty to ninety percent give the following results: Heads of Family earn more than non-Heads of Family, those without children more than those with (an exception to other samples), Liberal Professions more than those in Government, and one person in a suburban environment more than those in rural areas. Discussions with various members of the Comissão de Planejamento of the Universidade Federal de Espírito Santo indicate that the age-income profile (Figure 27) for this group may be a good example of a "change in quality" of education reflected in cross-section data. The agronomists in the younger age groups generally represent post World War II graduates. Prior to that time Agronomy is reputed to have been little more than a vocational

TABLE 2.6

STATE OF ESPÍRITO SANTO

REGRESSIONS OF 100 INCOME FROM SAMPLE OF LAW

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Sig.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sig.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sig.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	222												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	1	0.02314	0.04469	0.07253	35,000	0.02314	-0.06857	-0.11043	33,331				
x_9 - 27 " "	47	-0.35221	-0.04554	-5.09978	17,951	-0.35221	-0.04866	-1.82754	22,360				
x_{10} 32 " "	51	-0.13835	-0.35812	-3.12022	23,395	-0.13835	-0.23024	-1.94374	28,355				
x_{11} 39 " "	64		intercept		33,169		intercept		35,697				
x_{12} 49 " "	16	0.18976	0.05116	0.13820	35,226	0.18976	0.05321	0.15808	37,649				
x_{13} 59 " "	6	0.11679	0.28517	1.09232	46,714	0.11679	0.29184	1.12020	47,795				
x_{14} 68 " "	5	0.16876	0.56229	1.98035	58,729	0.16876	0.54590	1.88171	61,619				
Course Completed													
x_{15} Secondary	0												
x_{16} Philosophy	0												
x_{17} Medicine	0												
x_{18} Pharmacy	0												
x_{19} Dentistry	0												
x_{20} Engineering	0												
x_{21} Law	222												
x_{22} Agronomy	0												
x_{23} Econ./Pol. Science	0												
x_{24} All other courses completed except Seminary	0												
Sex													
x_{25} Female	16					-0.16222	-0.56149	-2.87934	20,360				
x_{26} Male	206						intercept		35,697				
Head of Family													
x_{27} Not Head	39					-0.14381	-0.13851	-0.94124	31,079				
x_{28} Head	183						intercept		35,697				

Religion						
z_{29}- Protestant	9		0.05951	0.05388	0.24617	37,073
z_{30}- Jewish	0					
z_{31}- Other	8		-0.00607	0.04366	0.25469	38,048
z_{32}- Roman Catholic	205			intercept		35,697
Race						
z_{33}- Black	1		-0.06138	-0.64321	-1.08092	18,392
z_{34}- White	206			intercept		35,697
z_{35}- Other	15		-0.07943	-0.14220	-0.79438	30,945
Children						
z_{36}- Has Children	187		0.21034	0.03855	0.30809	37,180
z_{37}- No Children	33			intercept		35,697
Class of Activity						
z_{38}- Agriculture	2		0.08280	-0.25137	-0.42634	27,707
z_{39}- Extractive	0					
z_{40}- Mfg. Industry	7		0.07346	0.00552	0.01713	35,895
z_{41}- Commerce and Transportation	42		0.09598	-0.10589	-0.48190	32,110
z_{42}- Service Industries	1		-0.06138	0.51948	0.80486	60,022
z_{43}- Government or Other	90			intercept		35,697
z_{44}- Liberal Professions	58		-0.05297	-0.28912	-1.27999	26,734
z_{45}- Social Services	26		-0.12056	-0.08053	-0.62364	32,072
Position						
z_{46}- Public Employee	116			intercept		35,697
z_{47}- Employer or Own Account	77		0.05417	0.27653	1.29518	47,088
z_{48}- Private Employee	29		0.05241	0.26963	1.19174	46,744
Migration						
z_{49}- No Migration	90		-0.04159	-0.03908	-0.43222	34,328
z_{50}- From Rural	19		-0.04695	-0.11244	-0.73629	31,900
z_{51}- From Urban	113			intercept		35,697
Environment						
z_{52}- Urban	202		0.10655	-0.07580	-0.25358	33,091
z_{53}- Suburban	14		-0.12078	-0.37455	-1.11499	24,525
z_{54}- Rural	9			intercept		35,697
Analysis of Variance						
"F" Value		9.15348		3.58068		
R^2 ($\bar{R}^2$)		.20847 (.18504)		.31349 (.22986)		
Std. Error of Estimate		0.61147		0.79455		

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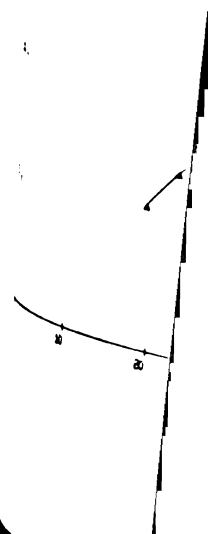


Fig. 26

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960

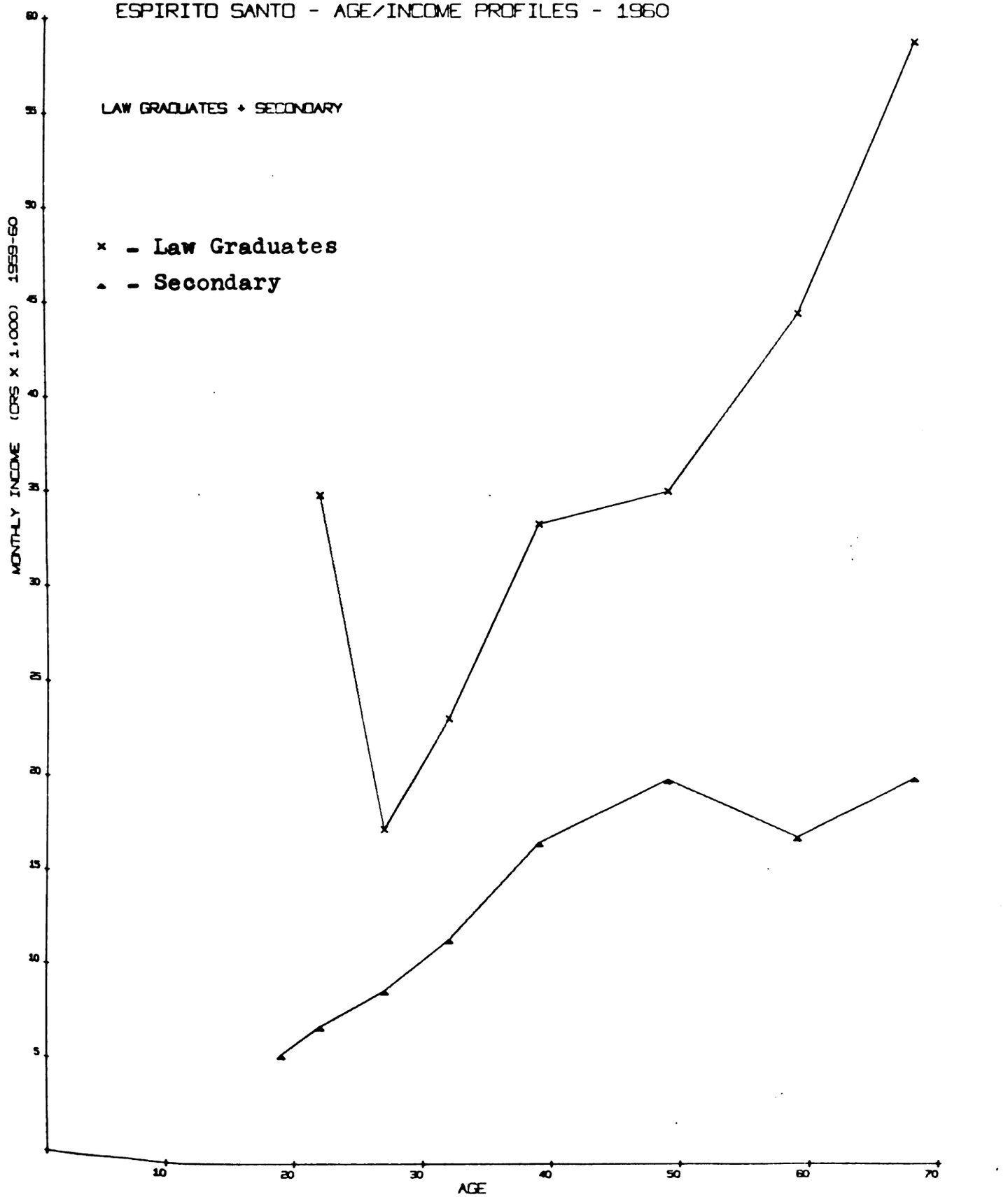
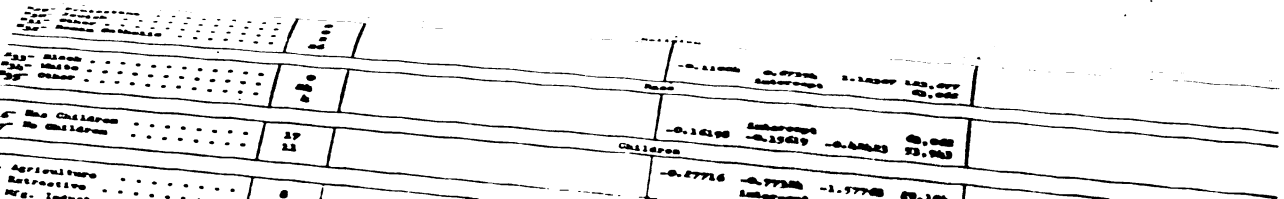


TABLE 17

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF AGRONOMY

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	28												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	3	-0.04040	-0.33207	-0.89840	26,388	-0.04040	-1.28914	-1.76019	17,374				
z_9 - 27 " "	5	0.05011	-0.21909	-0.69219	29,504	0.05011	-0.51851	-1.27926	37,547				
z_{10} - 32 " "	7	0.011465	-0.26048	-0.89568	28,346	0.011465	0.19822	0.40628	76,888				
z_{11} - 39 " "	6		intercept		36,761		intercept		63,062				
z_{12} - 49 " "	6	-0.20721	-0.47328	-1.56822	22,913	-0.20721	-0.61108	-1.50293	33,216				
z_{13} - 59 " "	1	-0.23810	-0.89693	-1.58859	15,000	-0.23810	-0.84136	-1.14903	27,186				
z_{14} - 68 " "	0												
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	28												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	0												
z_{26} - Male	28												
Head of Family													
z_{27} - Not Head	4					0.00956	-1.34291	-1.07631	16,465				
z_{28} - Head	24						intercept		63,062				



Religion						
z_{29}- Protestant	0					
z_{30}- Jewish	0					
z_{31}- Other	2		-0.11004	0.07358	1.12369	123,077
z_{32}- Roman Catholic	25			Intercept		63,062
Race						
z_{33}- Black	0					
z_{34}- White	24			Intercept		63,062
z_{35}- Other	4		-0.16198	-0.15619	-0.42823	93,913
Children						
z_{36}- Has Children	17		-0.27716	-0.77324	-1.57768	29,184
z_{37}- No Children	11			Intercept		63,062
Class of Activity						
z_{38}- Agriculture	8		-0.21665	-0.68337	-0.02488	42,224
z_{39}- Extractive	0					
z_{40}- Mfg. Industry	0					
z_{41}- Commerce and Transportation	6		0.08539	0.98839	1.24975	199,975
z_{42}- Service Industries	0					
z_{43}- Government or Other	7			Intercept		63,062
z_{44}- Liberal Professions	4		0.24142	1.12358	1.30104	193,971
z_{45}- Social Services	3		-0.04040	0.17853	0.33457	75,389
Position						
z_{46}- Public Employee	12			Intercept		63,062
z_{47}- Employer or Own Account	5		0.05011	-0.24608	-0.38420	49,308
z_{48}- Private Employee	11		0.06305	-1.21477	-1.51541	18,716
Migration						
z_{49}- No Migration	6		-0.11802	-0.12799	-0.41825	55,486
z_{50}- From Rural	2		-0.11004	-0.58483	-0.98242	35,868
z_{51}- From Urban	29			Intercept		63,062
Environment						
z_{52}- Urban	22		0.16945	0.39822	0.95648	93,911
z_{53}- Suburban	1		0.08538	2.04327	1.69904	486,978
z_{54}- Rural	5			Intercept		63,062
Analysis of Variance						
"F" Value		0.80751		1.00947		
R^2 ($\bar{R}^2$)		.15906 (<<0)		.70565 (.11695)		
Std. Error of Estimate		0.52272		0.51162		

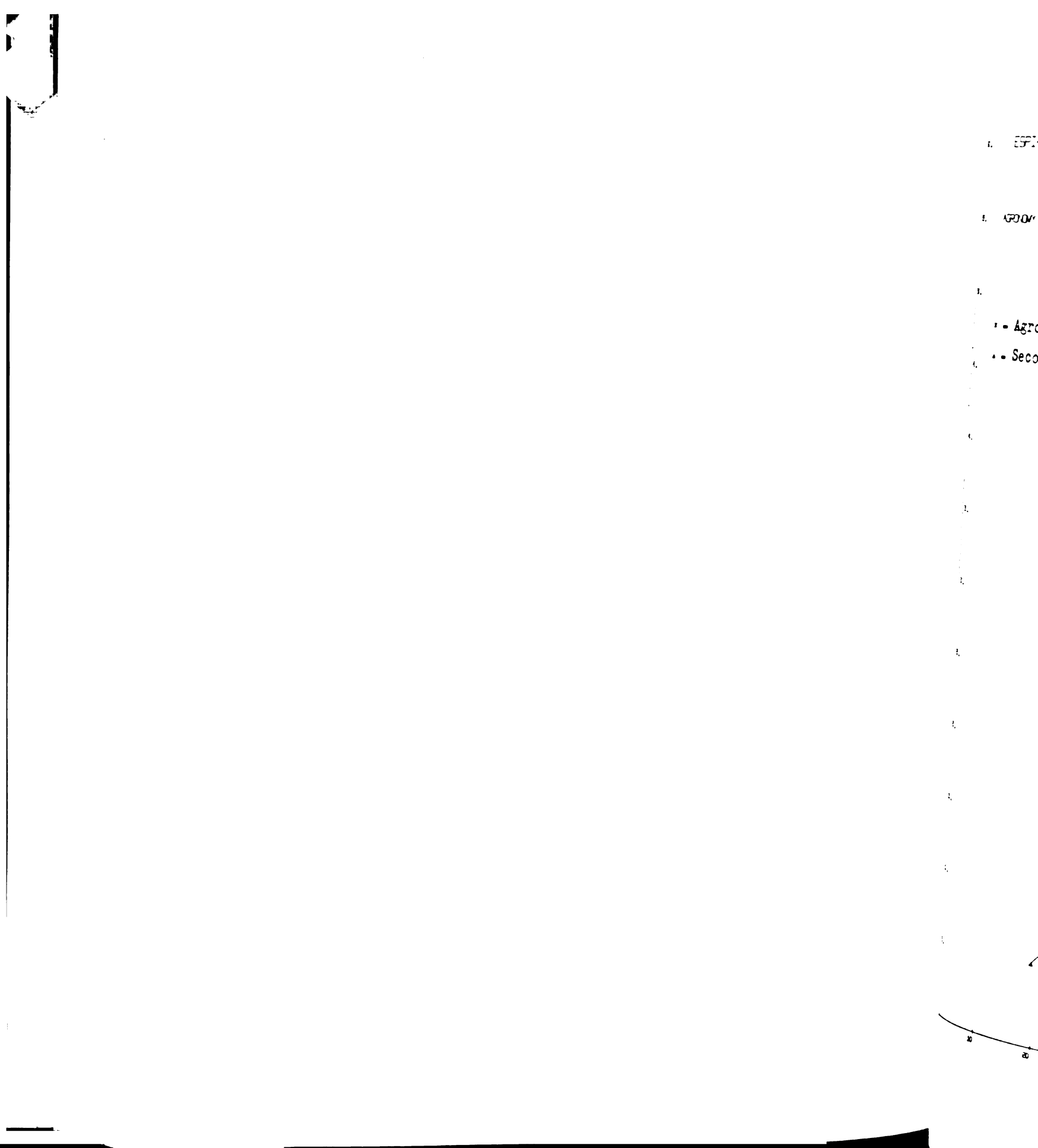
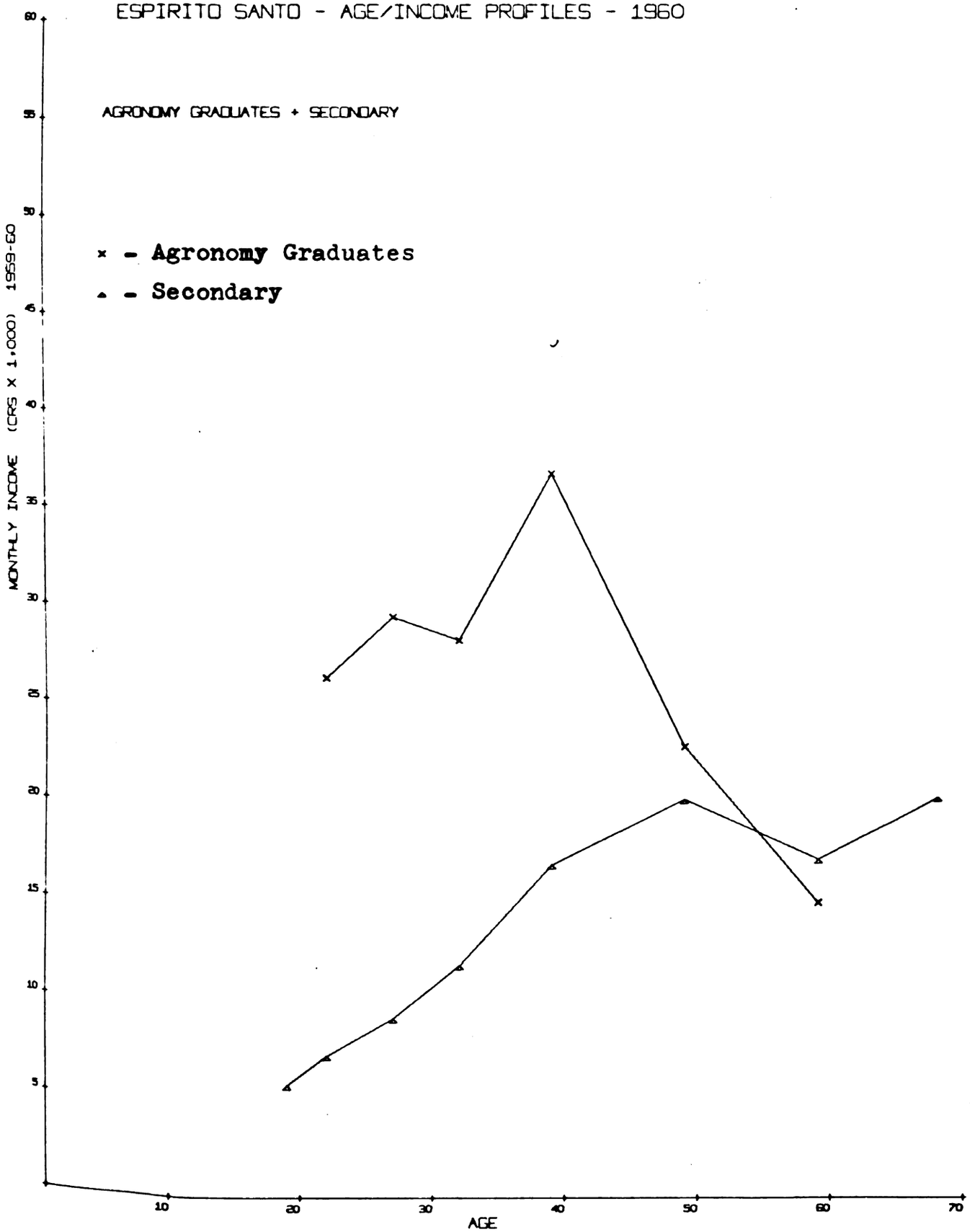


Fig. 27

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960



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Economic and Political Sciences.--The small population of this group does not permit any significant study beyond preparation of an age-income profile. The single regression and profile are contained in Table 28 and Figure 28.

Other Courses Completed.--The regression of log income on all variables using the sample of "Other Courses Completed" (see Table 29) has an overall level of significance over ninety percent. The small population and varied makeup of the sample probably account for the anomaly found in the Years Completed variables. Those persons completing four and five years have smaller incomes than those completing three years. All other differences are significant only in the fifty to eighty percent range and include the following: Commerce/Transportation and Liberal Professions have higher incomes than the other Classes of Activities, Public Employees higher than Self-Employed, No Migration higher than migration From Urban, which in turn is higher than migration From Rural. The earnings profile (Figure 29) is generally low when compared to the secondary counterpart.

Studies by Years of University Completed.--Regressions on all variables are performed for sub-samples consisting of persons (not necessarily university graduates) who had completed each year of university training from one through six. The minimum complete university course required three

TABLE 28

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ECONOMIC AND POLITICAL SCIENCES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº				Regression nº			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	10												
x_5 - 5 years	0												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	0												
x_9 - 27 " "	3	0.11387	0.09927	0.16684	38,673								
x_{10} - 32 " "	2	0.37146	0.57256	0.86067	62,018								
x_{11} - 39 " "	3		intercept		35,000								
x_{12} - 49 " "	1	0.01819	-0.00000	-0.00000	35,000								
x_{13} - 59 " "	0												
x_{14} - 68 " "	1	-0.74204	-1.09711	-2.25450	5,290								
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	10												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	1												
x_{26} - Male	9												
Head of Family													
x_{27} - Not Head	1												
x_{28} - Head	9												

Religion				
z_{29}- Protestant	0			
z_{30}- Jewish	0			
z_{31}- Other	1			
z_{32}- Roman Catholic	9			
Race				
z_{33}- Black	0			
z_{34}- White	10			
z_{35}- Other	0			
Children				
z_{36}- Has Children	9			
z_{37}- No Children	1			
Class of Activity				
z_{38}- Agriculture	0			
z_{39}- Extractive	0			
z_{40}- Mfg. Industry	0			
z_{41}- Commerce and Transportation .	5			
z_{42}- Service Industries	0			
z_{43}- Government or Other	1			
z_{44}- Liberal Professions	2			
z_{45}- Social Services	2			
Position				
z_{46}- Public Employee	5			
z_{47}- Employer or Own Account . . .	3			
z_{48}- Private Employee	2			
Migration				
z_{49}- No Migration	3			
z_{50}- From Rural	1			
z_{51}- From Urban	6			
Environment				
z_{52}- Urban	10			
z_{53}- Suburban	0			
z_{54}- Rural	0			
Analysis of Variance				
"F" Value		2.00712		
$R^2(\bar{R}^2)$		.4163 (.42435)		
Std. Error of Estimate . . .		0.72874		

Fig. 28

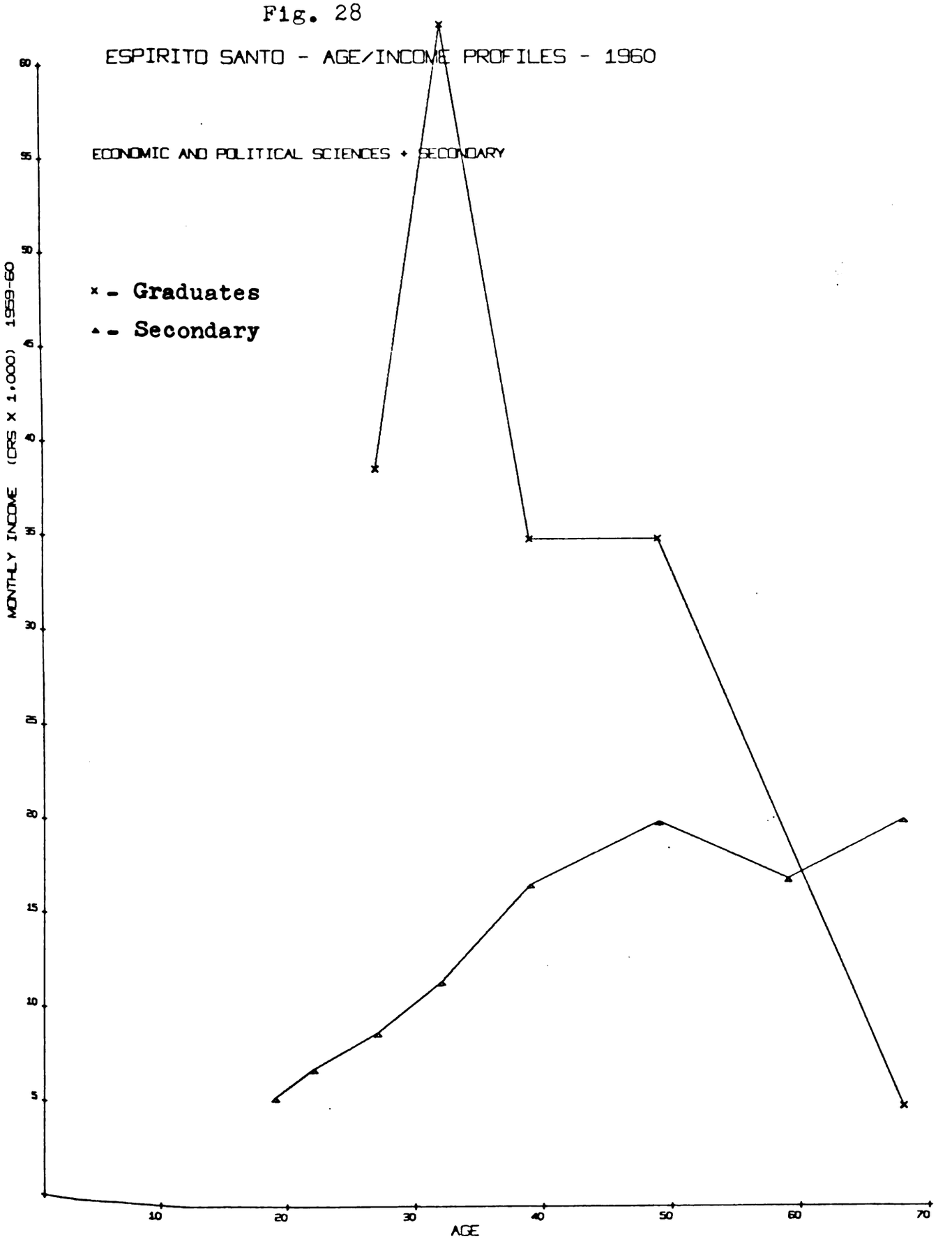

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960
ECONOMIC AND POLITICAL SCIENCES + SECONDARY
× - Graduates
▲ - Secondary
MONTHLY INCOME (CR$ X 1,000) 1959-60
AGE
10
20
30
40
50
60
70

TABLE 29

STATE OF ESPÍRITO SANTO

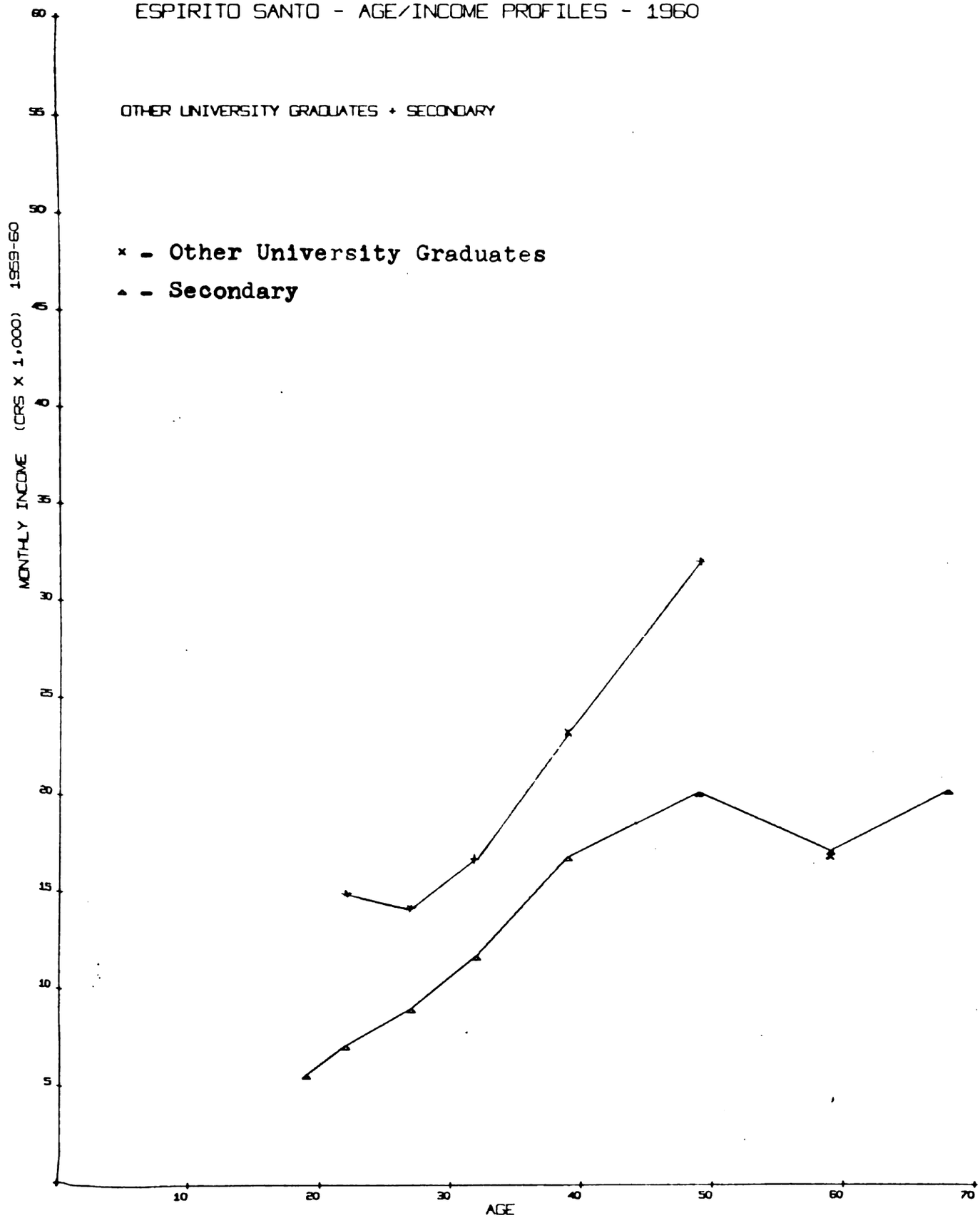
REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL OTHER COURSES COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0						Intercept		26,287		Intercept		31,536
z_3 - 3 years	18					-0.43818	-0.57757	-2.59671	14,754	-0.43818	-0.76891	-2.47049	14,617
z_4 - 4 years	14					0.04380	-0.13738	-0.30755	22,913	0.04380	-1.60411	-1.51687	6,341
z_5 - 5 years	2												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	1	-0.08566	-0.44187	-0.68585	15,000	-0.08566	-0.56103	-0.92967	15,000	-0.08566	-1.08954	-1.50985	10,608
z_9 - 27 " "	6	-0.26196	-0.48872	-1.57907	14,313	-0.26196	-0.22282	-0.70970	21,036	-0.26196	-0.17371	-0.41997	26,507
z_{10} - 32 " "	9	-0.18331	-0.32343	-1.18493	16,086	-0.18331	-0.12171	-0.44217	23,275	-0.18331	-0.11179	-0.30088	28,200
z_{11} - 39 " "	12		Intercept		23,334		Intercept		26,287		Intercept		31,536
z_{12} - 49 " "	6	0.32326	0.31384	1.01405	31,937	0.32326	0.48347	1.99173	42,630	0.32326	0.32881	0.91989	43,814
z_{13} - 59 " "	0												
z_{14} - 68 " "	0												
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	34												
Sex													
z_{25} - Female	5									-0.46278	-0.10915	-0.07454	28,275
z_{26} - Male	29										Intercept		31,536
Head of Family													
z_{27} - Not Head	8									-0.57761	-1.05443	-0.60150	11,209
z_{28} - Head	26										Intercept		31,536

Religion							
z_{29}- Protestant	3			-0.011468	0.11327	0.17830	35,318
z_{30}- Jewish	0						
z_{31}- Other	2			0.21064	-0.24224	-0.33570	24,751
z_{32}- Roman Catholic	29				intercept		31,536
Race							
z_{33}- Black	0						
z_{34}- White	33						
z_{35}- Other	1						
Children							
z_{36}- Has Children	22			0.36949	0.00780	0.02690	31,783
z_{37}- No Children	12				intercept		31,536
Class of Activity							
z_{38}- Agriculture	3			-0.25576	0.32213	0.18674	43,522
z_{39}- Extractive	0						
z_{40}- Mfg. Industry	4			-0.02640	0.47734	0.37486	50,860
z_{41}- Commerce and Transportation	2			0.21064	1.30929	1.09524	116,795
z_{42}- Service Industries	0						
z_{43}- Government or Other	20				intercept		31,536
z_{44}- Liberal Professions	1			-0.08566	1.96882	1.10141	225,869
z_{45}- Social Services	4			-0.27008	-0.01061	-0.01983	31,288
Position							
z_{46}- Public Employee	24				intercept		31,536
z_{47}- Employer or Own Account	3			-0.11736	-1.21052	-0.86117	9,399
z_{48}- Private Employee	7			-0.03134	0.29629	0.31473	42,412
Migration							
z_{49}- No Migration	10			-0.20755	0.25152	0.67843	40,995
z_{50}- From Rural	2			0.04380	-0.83519	-1.12279	13,080
z_{51}- From Urban	22				intercept		31,536
Environment							
z_{52}- Urban	29			0.17572	0.09043	0.19492	34,521
z_{53}- Suburban	1				intercept		31,536
z_{54}- Rural	4				intercept		31,536
Analysis of Variance							
"F" Value		1.69049	2.43562		1.66910		
$R^2(\bar{R}^2)$		.18908 (.10799)	.35117 (.23531)		.79333 (.47538)		
Std. Error of Estimate		0.61899	0.57382		0.53213		

Fig. 29

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960



years; hence, those with one or two years did not have diplomas. Twenty-five of the 115 persons in the three-year sample did not have degrees; eleven out of 152 in the four-year group were not graduates; only one of 286 in the five-year sample had not graduated; and at the six-year level, all were degree holders. The six-year level for Espírito Santo is equal to graduates in Medicine. Age-income profiles for the six samples are plotted in Figures 30 and 31 and the relevant regressions summarized in Tables 30 through 35. The influences discussed when considering the other sub-samples are not changed significantly by this alternative selection. The general trend toward higher income profiles with increased years of education is evident from the graph. Those completing one, two, and three years of university do not fare much better than their secondary graduate cohorts, while four, five and six-year graduates show considerably improved profiles relative to the secondary group.

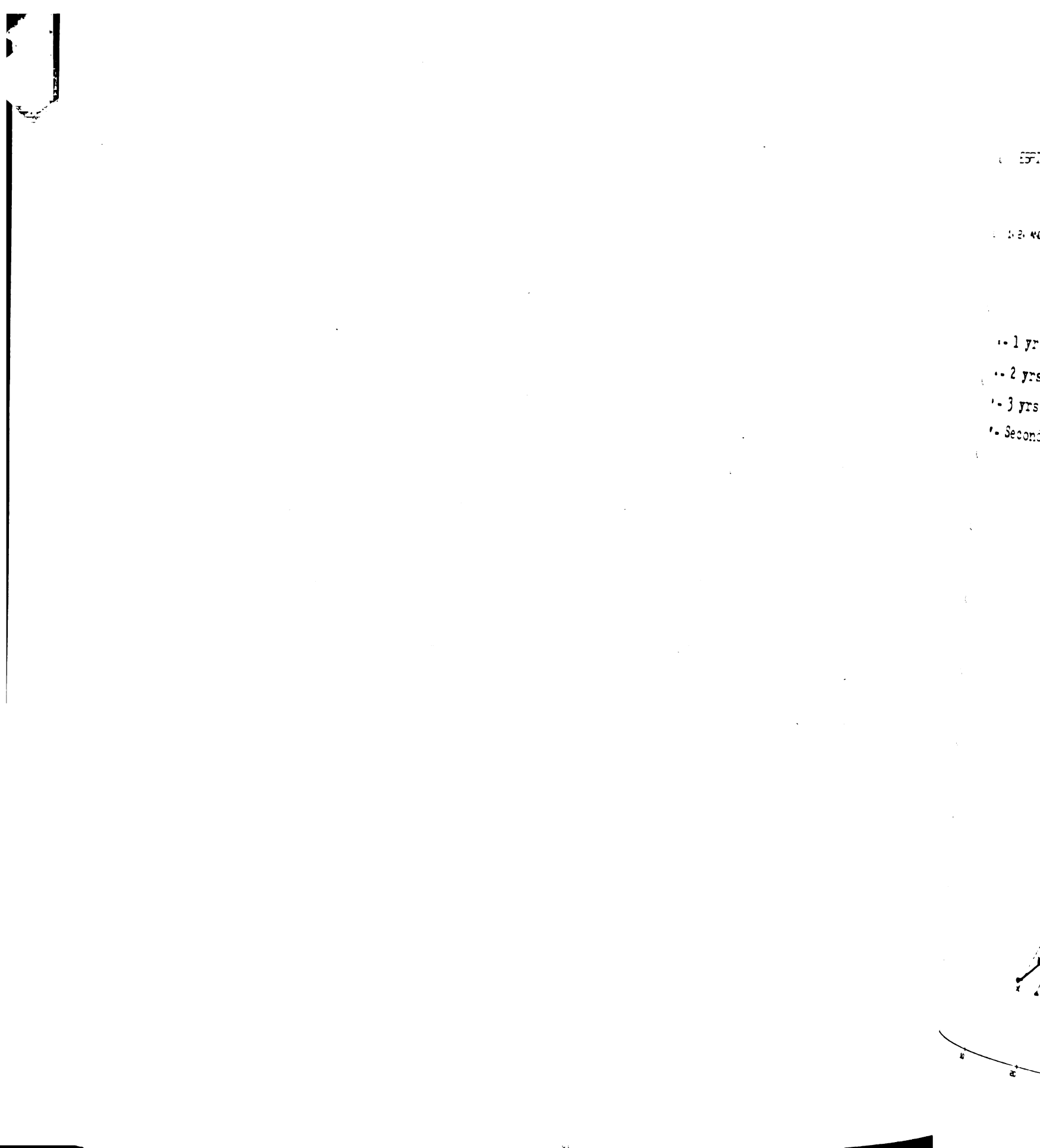


Fig. 30

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960

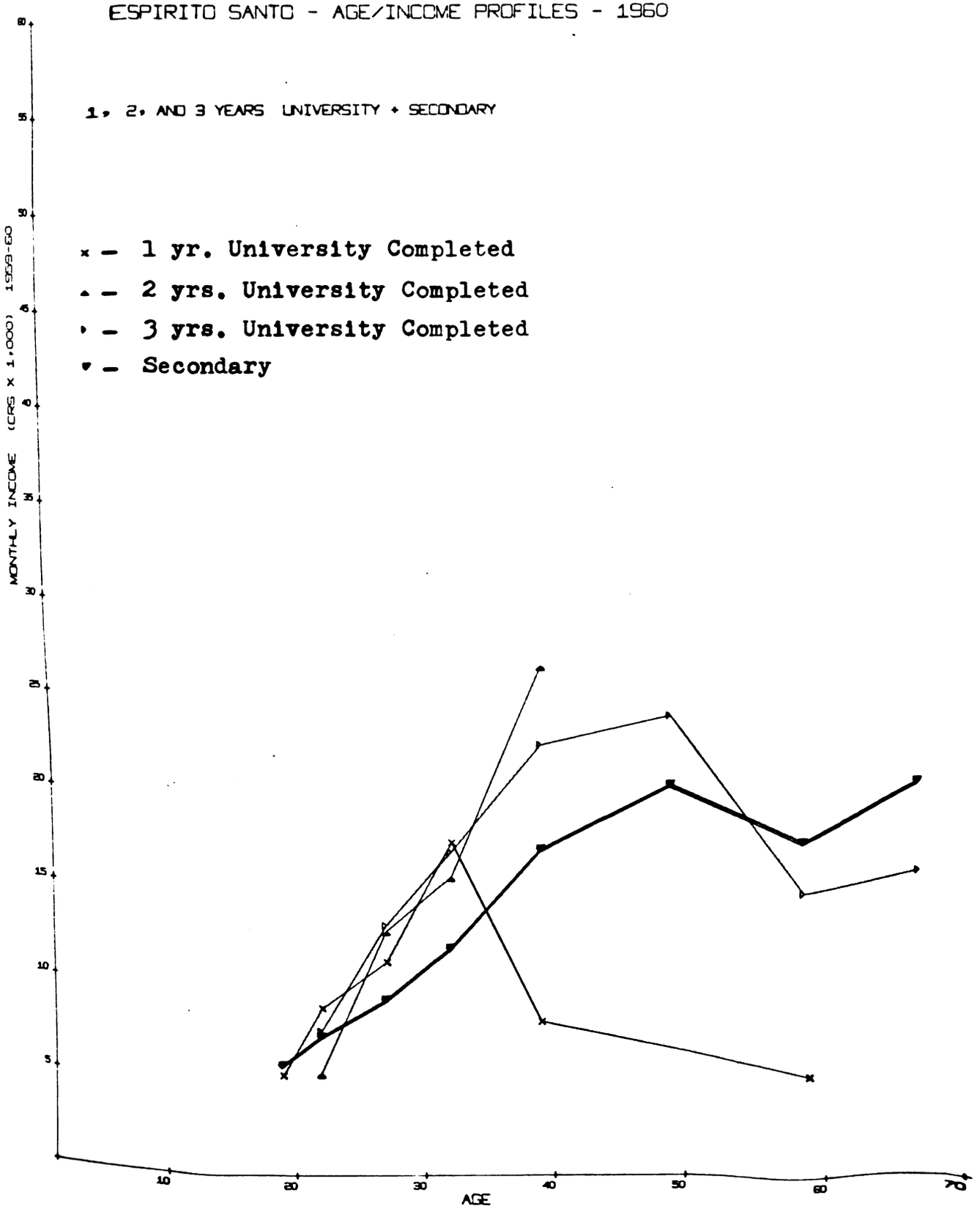


Fig. 31

ESPIRITO SANTO - AGE/INCOME PROFILES - 1960

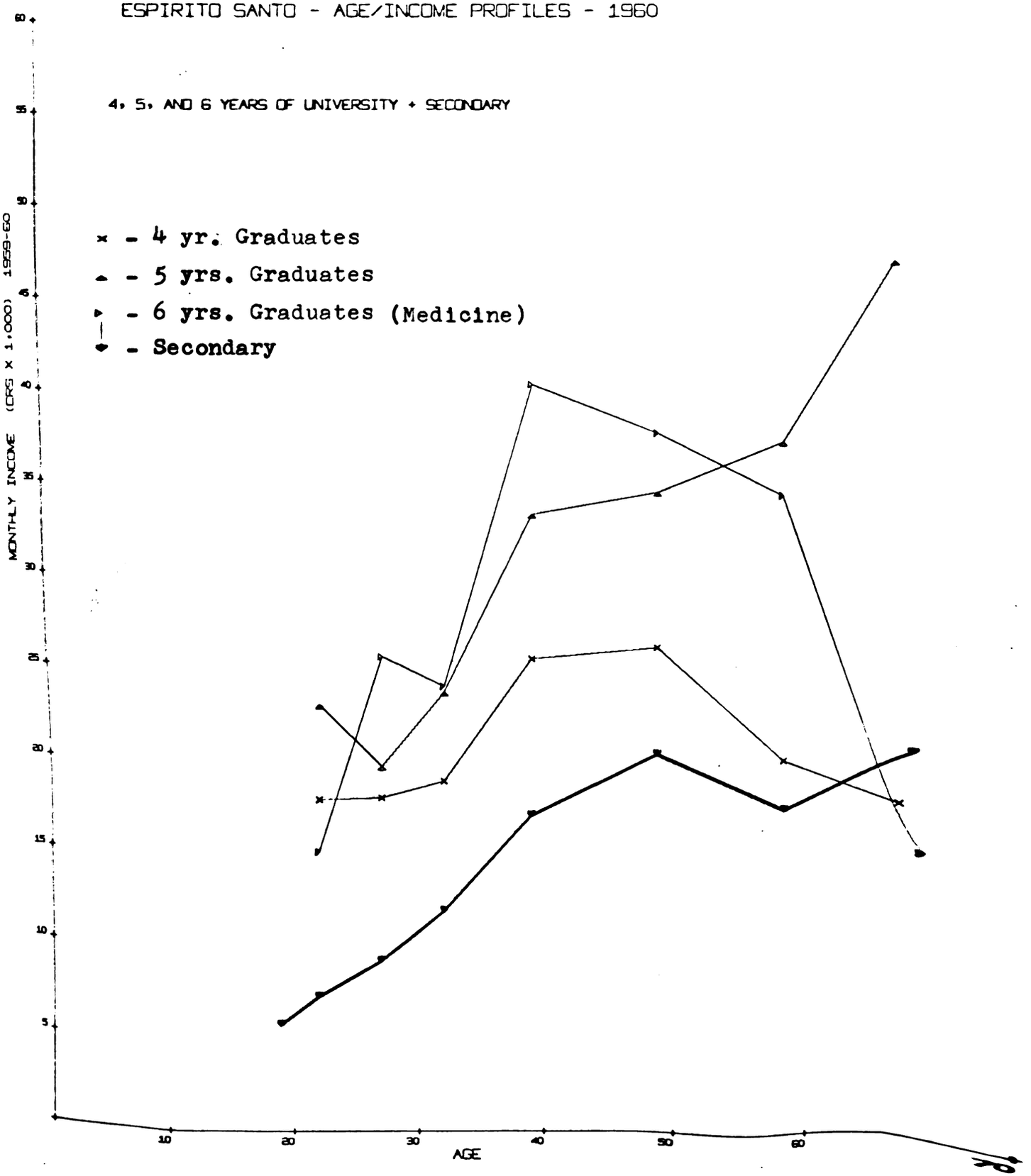


TABLE 30

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 1 YEAR UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	33												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	1	-0.16401	-0.42121	-0.41904	5,250	-0.16401	-0.33883	-0.35664	13,976				
z_8 - 22 " "	15	-0.20550	0.07883	0.10739	8,656	-0.20550	-0.52090	-0.76547	11,419				
z_9 - 27 " "	9	0.07437	0.32546	0.43440	11,077	0.07437	0.26158	0.34059	25,476				
z_{10} - 32 " "	6	0.35160	0.76981	1.00273	17,275	0.35160	0.16753	0.19637	23,189				
z_{11} - 39 " "	1		intercept		8,000		intercept		19;612				
z_{12} - 49 " "	0												
z_{13} - 59 " "	1	-0.16401	-0.42121	-0.41904	5,250	-0.16401	-1.03777	-0.60881	6,947				
z_{14} - 68 " "	0												
Course Completed													
z_{15} - Secondary	33												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	6					-0.25135	-0.37081	-0.85317	13,536				
z_{26} - Male	27						intercept		19,612				
Head of Family													
z_{27} - Not Head	18					-0.23279	-0.79987	-1.63857	10,765				
z_{28} - Head	15						intercept		19,612				

Religion						
z_{29}- Protestant	1		0.30725	1.71997	2.40407	189,522
z_{30}- Jewish	0					
z_{31}- Other	2		-0.04830	0.68714	0.88018	21,398
z_{32}- Roman Catholic	30			intercept		19,612
Race						
z_{33}- Black	0					
z_{34}- White	31			intercept		19,612
z_{35}- Other	2		-0.04830	-0.82125	-1.23379	8,827
Children						
z_{36}- Has Children	7		0.26295	-0.13304	-0.23812	17,169
z_{37}- No Children	26			intercept		19,612
Class of Activity						
z_{38}- Agriculture	0					
z_{39}- Extractive	0					
z_{40}- Mfg. Industry	2		0.30726	0.89563	1.51681	48,088
z_{41}- Commerce and Transportation	11		-0.05611	-0.57991	-0.95138	10,982
z_{42}- Service Industries	3		-0.18192	-1.12161	-1.63804	6,389
z_{43}- Government or Other	7			intercept		19,612
z_{44}- Liberal Professions	0					
z_{45}- Social Services	10		-0.16383	-0.52589	-1.37784	11,991
Position						
z_{46}- Public Employee	19			intercept		19,612
z_{47}- Employer or Own Account	3		0.14311	0.80736	1.06184	47,632
z_{48}- Private Employee	13		-0.09532	0.57151	1.04377	34,732
Migration						
z_{49}- No Migration	13		-0.03417	0.09611	0.33132	21,991
z_{50}- From Rural	6			intercept		19,612
z_{51}- From Urban	14			intercept		19,612
Environment						
z_{52}- Urban	33					
z_{53}- Suburban	0					
z_{54}- Rural	0					
Analysis of Variance						
"F" Value		1.21601		1.87793		
$R^2(\bar{R}^2)$		.18379 (.06720)		.70713 (.37522)		
Std. Error of Estimate		0.71076		0.59126		

TABLE 31

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 2 YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	30												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	8	-0.67870	-1.60227	-5.63609	5,332	-0.67870	-1.08625	-1.39976	5,723	-0.67870	-0.42054	-0.89901	43,465
z_9 - 27 " "	10	0.06202	-0.73465	-2.68973	12,697	0.06202	-0.29248	-0.42312	12,657	0.06202	0.54643	1.17929	114,313
z_{10} - 32 " "	7	0.20110	-0.53670	-1.83807	15,476	0.20110	0.05188	0.06625	17,861	0.20110	0.88786	1.80605	160,833
z_{11} - 39 " "	5		Intercept		26,469		Intercept		16,977		Intercept		66,188
z_{12} - 49 " "	0												
z_{13} - 59 " "	0												
z_{14} - 68 " "	0												
Course Completed													
z_{15} - Secondary	30												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	3					-0.36312	0.60680	0.45015	31,110	-0.36312	0.85174	1.16447	155,127
z_{26} - Male	27						Intercept		16,977		Intercept		66,188
Head of Family													
z_{27} - Not Head	14					-0.59044	0.10058	0.21055	18,751	-0.59044	0.12842	0.47692	75,258
z_{28} - Head	16						Intercept		16,977		Intercept		66,188

Religion									
z_{29} Protestant	3		-0.20001	-0.92644	-0.80156	6,713	-0.20008	-0.93710	-1.52749	25,990
z_{30} Jewish	0									
z_{31} Other	1		-0.21302	-0.51389	-0.29954	9,847	-0.21302	-0.07970	-0.08812	61,118
z_{32} Roman Catholic	26			Intercept		16,957		Intercept		66,188
Race									
z_{33} Black	0									
z_{34} White	28			Intercept		16,957		Intercept		66,188
z_{35} Other	2		0.04790	0.60862	1.14351	31,166	0.04790	0.37309	1.44428	96,129
Children									
z_{36} Has Children	11		0.53995	-0.32814	-0.45251	12,214	0.53995	-0.01596	-0.04392	65,140
z_{37} No Children	19			Intercept		16,957		Intercept		66,188
Class of Activity									
z_{38} Agriculture	0									
z_{39} Extractive	1		0.27959	0.69216	0.58005	33,882	0.27959	1.25544	1.77558	232,279
z_{40} Mfg. Industry	4		0.31285	0.05536	0.07168	17,923	0.31285	0.33767	0.61640	92,775
z_{41} Commerce and Transportation	9		0.01872	-0.01568	-0.03158	16,694	0.01872	0.33374	1.11393	92,411
z_{42} Service Industries	0									
z_{43} Government or Other	13			Intercept		16,957		Intercept		66,188
z_{44} Liberal Professions	1		-0.21302	-0.55087	-0.54330	9,775	-0.21302	0.18466	0.34369	79,612
z_{45} Social Services	2		-0.11042	0.15359	0.16906	19,772	-0.11042	-0.40111	-0.86506	44,317
Position									
z_{46} Public Employee	16			Intercept		16,957		Intercept		66,188
z_{47} Employer or Own Account	6		0.27026	0.76777	0.94976	36,543	0.27026	0.18426	0.46453	79,760
z_{48} Private Employee	8		0.19517	0.36061	0.54238	24,321	0.19517	0.07860	0.22508	71,600
Migration									
z_{49} No Migration	12		-0.48524	-0.40367	-1.22274	11,325	-0.48524	-0.65785	-3.38766	34,283
z_{50} From Rural	5			Intercept		16,957	-0.09237	-0.58829	-2.06853	36,752
z_{51} From Urban	13			Intercept		16,957		Intercept		66,188
Environment									
z_{52} Urban	27						-0.22117	-1.95523	-4.83690	9,368
z_{53} Suburban	2						-0.14917	-2.43823	-4.79119	5,779
z_{54} Rural	1							Intercept		66,188
Analysis of Variance									
"F" Value		11.89690		1.55491			7.87496		
R^2 ($\bar{R}^2$)		.57057 (.54736)		.08777 (.30349)			.94993 (.84291)		
Std. Error of Estimate		0.49867		0.43181			0.30955		

TABLE 52

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 3 YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	115												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	14	-0.37200	-1.09378	-4.74183	7,481	-0.37200	-1.02025	-4.09926	7,875	-0.37200	-0.67255	-2.42608	12,057
z_9 - 27 " "	27	-0.14059	-0.54370	-2.79518	12,968	-0.14059	-0.43079	-2.14800	14,198	-0.14059	-0.28189	-1.31450	17,819
z_{10} - 32 " "	21	0.04544	-0.28542	-1.38344	16,789	0.04544	-0.20421	-0.99325	17,809	0.04544	-0.08778	-0.41144	21,636
z_{11} - 39 " "	21		intercept		22,335		intercept		21,844		intercept		23,622
z_{12} - 49 " "	17	0.23629	0.06231	0.28569	23,771	0.23629	0.14855	0.64502	25,342	0.23629	0.07195	0.32138	25,384
z_{13} - 59 " "	10	-0.03014	-0.42846	-1.66807	14,552	-0.03014	-0.26630	-0.94743	16,737	-0.03014	-0.16283	-0.59677	20,072
z_{14} - 68 " "	5	0.00057	-0.35439	-1.06528	15,670	0.00057	-0.18642	-0.52406	18,129	0.00057	-0.34309	-1.00132	16,761
Course Completed													
z_{15} - Secondary	25						intercept		21,844		intercept		23,622
z_{16} - Philosophy	11					-0.16478	-0.29581	-1.21434	16,250	-0.16478	-0.08000	-0.30406	21,805
z_{17} - Medicine	0												
z_{18} - Pharmacy	17					0.00901	-0.19667	-0.82652	17,944	0.00901	-0.32469	-1.34958	17,072
z_{19} - Dentistry	44					-0.02459	-0.13860	-0.77200	19,017	-0.02459	-0.23352	-0.98174	18,702
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	18					0.30170	0.30791	1.38999	29,721	0.30170	-0.16571	-0.66609	20,014
Sex													
z_{25} - Female	19									-0.33768	-0.30200	-1.34705	17,454
z_{26} - Male	96										intercept		23,622
Head of Family													
z_{27} - Not Head	36									-0.47162	-0.28742	-1.41104	17,721
z_{28} - Head	79										intercept		23,622

Religion							
z_{29}- Protestant	10			0.15969	0.38333	1.81788	34,697
z_{30}- Jewish	0						
z_{31}- Other	8			0.17954	0.31648	1.28452	32,489
z_{32}- Roman Catholic	97				Intercept		23,622
Race							
z_{33}- Black	0						
z_{34}- White	110				Intercept		23,622
z_{35}- Other	9			-0.14535	-0.42647	-1.28407	15,419
Children							
z_{36}- Has Children	65			0.38426	0.25071	1.62679	30,352
z_{37}- No Children	30				Intercept		23,622
Class of Activity							
z_{38}- Agriculture	2			-0.06418	-0.52625	-0.78819	13,690
z_{39}- Extractive	1			0.10223	0.35952	0.50096	33,841
z_{40}- Mfg. Industry	6			-0.06829	-0.30806	-0.74339	17,359
z_{41}- Commerce and Transportation	25			0.01710	-0.07513	-0.22260	21,912
z_{42}- Service Industries	1			-0.08507	-1.21872	-1.71607	6,776
z_{43}- Government or Other	18				Intercept		23,622
z_{44}- Liberal Professions	33			-0.05362	-0.18013	-0.41028	19,788
z_{45}- Social Services	29			-0.22782	-0.41949	-1.69040	15,588
Position							
z_{46}- Public Employee	38				Intercept		23,622
z_{47}- Employer or Own Account	33			-0.00514	-0.31379	-1.09087	17,299
z_{48}- Private Employee	24			-0.14594	-0.31872	-1.24752	17,175
Migration							
z_{49}- No Migration	49			-0.12880	-0.05673	-0.41011	22,319
z_{50}- From Rural	7			-0.13807	-0.03787	-0.14589	22,744
z_{51}- From Urban	99				Intercept		23,622
Environment							
z_{52}- Urban	104			0.18996	0.39191	1.22283	34,955
z_{53}- Suburban	4			-0.17820	-0.20854	-0.64908	19,175
z_{54}- Rural	7				Intercept		23,622
Analysis of Variance							
"F" Value		5.35686	4.13650		3.57683		
R^2 ($\bar{R}^2$)		.22935 (.19401)	.28456 (.22324)		.58961 (.40298)		
Std. Error of Estimate		0.68853	0.65441		0.57608		

TABLE 33

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 4 YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim. Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log. Inc.	Sim. Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log. Inc.	Sim. Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log. Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	152												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	11	-0.05790	-0.35095	-1.49946	17,849	-0.05790	-0.32442	-1.42020	14,399	-0.05790	-0.37216	-1.53978	13,872
z_9 - 27 " "	46	-0.13213	-0.34657	-2.12687	17,928	-0.13213	-0.027772	-1.74798	15,088	-0.13213	-0.26314	-1.62046	15,470
z_{10} - 32 " "	36	-0.06981	-0.29750	-1.74457	18,829	-0.06981	-0.22101	-1.33150	15,968	-0.06981	-0.25459	-1.59396	15,603
z_{11} - 39 " "	24		intercept		25,353		intercept		25,353		intercept		20,127
z_{12} - 49 " "	25	0.16374	0.02881	0.13416	25,990	0.16374	0.07741	0.39094	21,366	0.16374	0.01784	0.10050	20,490
z_{13} - 59 " "	6	-0.00828	-0.24245	-0.82085	19,895	-0.00828	-0.09502	-0.34060	18,023	-0.00828	-0.28326	-1.01529	15,162
z_{14} - 68 " "	4	-0.03729	-0.34369	-1.04064	17,623	-0.03729	-0.34972	-1.01655	14,039	-0.03729	-0.55172	-1.74270	11,592
Course Completed													
z_{15} - Secondary	11						intercept		25,353		intercept		20,127
z_{16} - Philosophy	36					-0.07285	0.12225	0.56914	22,507	-0.07285	0.63808	2.46949	38,098
z_{17} - Medicine	0												
z_{18} - Pharmacy	8					-0.10186	-0.07702	-0.25539	18,441	-0.10186	-0.24486	-0.80768	15,756
z_{19} - Dentistry	45					-0.04217	0.15633	0.74200	23,288	-0.04217	-0.10568	-0.44307	18,109
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	28					0.22928	0.46822	2.10991	31,811	0.22928	0.35655	1.63739	28,750
z_{23} - Econ./Pol. Science	10					0.20059	0.67378	2.44707	39,071	0.20059	0.52327	1.97341	33,965
z_{24} - All other courses completed except Seminary	14					-0.16081	-0.16040	-0.63319	16,966	-0.16081	-0.13600	-0.53701	17,568
Sex													
z_{25} - Female	28									-0.33086	-0.55908	-3.26991	11,507
z_{26} - Male	124										intercept		20,127
Head of Family													
z_{27} - Not Head	53									-0.39098	-0.17566	-1.23071	16,884
z_{28} - Head	99										intercept		20,127

Religion						
z_{29}- Protestant	16			-0.18483	-0.07261	-2.60613	18,272
z_{30}- Jewish	1						
z_{31}- Other	9				intercept		20,127
z_{32}- Roman Catholic	126			0.05312	-0.05877	-0.27080	18,978
Race						
z_{33}- Black	1						
z_{34}- White	140			0.07677	0.33286	1.79844	22,077
z_{35}- Other	11				intercept		20,127
Children						
z_{36}- Has Children	91			0.15981	-0.17003	-1.34156	16,980
z_{37}- No Children	61				intercept		20,127
Class of Activity						
z_{38}- Agriculture	14			0.05205	-0.08728	-0.35028	18,446
z_{39}- Extractive	1			-0.03858	-0.15047	-0.24116	17,315
z_{40}- Mfg. Industry	2			0.02029	0.58618	1.23750	34,171
z_{41}- Commerce and Transportation	21			0.17497	0.07736	0.32364	21,786
z_{42}- Service Industries	0				intercept		20,127
z_{43}- Government or Other	22			0.05055	-0.10260	-0.43722	18,168
z_{44}- Liberal Professions	46			-0.14150	-0.10758	-0.51537	18,078
z_{45}- Social Services	46						
Position						
z_{46}- Public Employee	56			-0.16293	-0.05045	-0.31188	19,137
z_{47}- Employer or Own Account	35			0.16255	0.48017	2.70403	32,535
z_{48}- Private Employee	40				intercept		20,127
Migration						
z_{49}- No Migration	51			-0.10258	-0.06441	-0.60986	18,872
z_{50}- From Rural	11			0.06121	-0.02944	-0.15270	19,583
z_{51}- From Urban	90				intercept		20,127
Environment						
z_{52}- Urban	127			0.13952	0.02114	0.10765	20,337
z_{53}- Suburban	11			-0.15564	-0.07919	-0.30332	18,395
z_{54}- Rural	14				intercept		20,127
Analysis of Variance						
"F" Value		1.54607	2.41138		2.95373	
$R^2(\bar{R}^2)$		.06013 (.02795)	.17230 (.10727)		.42290 (.28573)	
Std. Error of Estimate		0.64712	0.62024		0.55509	

TABLE 34

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 5 YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Sim.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	286												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	4	-0.03610	-0.37174	-1.19669	22,912	-0.03610	-0.41793	-1.32765	9,400	-0.03610	-0.19835	-0.61894	8,145
z_9 - 27 " "	43	-0.28831	-0.52680	-5.18313	19,621	-0.28831	-0.53971	-5.27741	8,323	-0.28831	-0.32618	-2.76724	7,167
z_{10} - 32 " "	42	-0.13429	-0.34071	-3.33703	23,634	-0.13429	-0.34849	-3.39562	10,076	-0.13429	-0.22883	-2.19144	7,900
z_{11} - 39 " "	82		intercept		33,228		intercept		14,278		intercept		9,932
z_{12} - 49 " "	54	0.15722	0.03585	0.33719	34,441	0.15722	0.04932	0.45741	15,000	0.15722	0.04108	0.39056	10,348
z_{13} - 59 " "	15	0.10412	0.11147	0.65432	37,147	0.10412	0.07534	0.43167	15,395	0.10412	0.07282	0.42351	10,682
z_{14} - 68 " "	6	0.11687	0.34208	1.33312	46,779	0.11687	0.33498	1.30491	19,959	0.11687	0.41207	1.59156	14,996
Course Completed													
z_{15} - Secondary	1						intercept		14,278		intercept		9,932
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	41					0.02729	0.90767	1.46930	35,388	0.02729	0.82344	1.28894	22,627
z_{21} - Law	222					-0.01370	0.84058	1.37310	33,092	-0.01370	0.91512	1.40505	24,800
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	2					-0.02543	0.47296	0.63019	22,912	-0.02543	0.34485	0.47115	14,304
Sex													
z_{25} - Female	16									-0.33101	-0.65197	-3.57511	5,174
z_{26} - Male	270										intercept		9,932
Head of Family													
z_{27} - Not Head	50									-0.29081	-0.07173	-0.60238	9,244
z_{28} - Head	236										intercept		9,932

Religion							
z_{29}- Protestant	11			0.03707	0.11443	0.57705	11,136
z_{30}- Jewish	0						
z_{31}- Other	11			-0.01047	0.12348	0.62168	11,230
z_{32}- Roman Catholic	268				Intercept		9,932
Race							
z_{33}- Black	1			-0.05668	-0.72589	-1.16809	8,806
z_{34}- White	288				Intercept		9,932
z_{35}- Other	29			-0.11239	-0.18686	-1.15687	8,239
Children							
z_{36}- Has Children	215			0.22801	0.17256	1.72052	11,882
z_{37}- No Children	71				Intercept		9,932
Class of Activity							
z_{38}- Agriculture	3			0.09675	0.46594	1.12183	15,826
z_{39}- Extractive	3			0.03610	0.23256	0.63092	12,533
z_{40}- Mfg. Industry	19			0.01767	-0.03444	-0.17185	9,995
z_{41}- Commerce and Transportation	99			0.09686	-0.03005	-0.18695	9,638
z_{42}- Service Industries	1			-0.05668	0.57828	0.92500	17,708
z_{43}- Government or Other	187				Intercept		9,932
z_{44}- Liberal Professions	65			-0.03676	-0.13795	-0.79571	8,852
z_{45}- Social Services	29			-0.10891	-0.07890	-0.60009	9,178
Position							
z_{46}- Public Employee	141				Intercept		9,932
z_{47}- Employer or Own Account	90			0.03168	0.17159	1.07143	11,791
z_{48}- Private Employee	95			0.10766	0.28216	1.80810	13,149
Migration							
z_{49}- No Migration	110			-0.08105	-0.05680	-0.72724	9,383
z_{50}- From Rural	19			-0.04456	-0.14662	-0.99695	8,577
z_{51}- From Urban	157				Intercept		9,932
Environment							
z_{52}- Urban	299			0.12134	0.15565	0.69899	11,604
z_{53}- Suburban	18			-0.13055	-0.11901	-0.45064	8,817
z_{54}- Rural	9				Intercept		9,932
Analysis of Variance							
"F" Value		7.88024	5.61501		3.49438		
R^2 ($\bar{R}^2$)		.14491 (.12965)	.15476 (.13035)		.22371 (.20568)		
Std. Error of Estimate		0.60666	0.60642		0.57965		

TABLE 35

STATE OF ESPÍRITO SANTO

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 6 YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Corr. Coef.	Regr. Coef.	"t" Value	Antilog log.Inc.	Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	0												
x_6 - 6 years	88												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	1	-0.11862	-0.98472	-1.40395	15,000	-0.11862	-0.39840	-0.51796	7,468				
x_9 - 27 " "	8	-0.11025	-0.45516	-1.59868	25,472	-0.11025	0.21831	0.58367	14,260				
x_{10} - 32 " "	18	-0.22101	-0.52023	-2.36346	23,868	-0.22101	-0.26881	-1.05982	8,502				
x_{11} - 39 " "	21		Intercept		10,157		Intercept		11,124				
x_{12} - 49 " "	28	0.14129	-0.06697	-0.33854	37,554	0.14129	0.06763	0.32667	11,902				
x_{13} - 59 " "	11	0.02769	-0.16030	-0.62850	34,208	0.02769	0.16566	0.51210	13,128				
x_{14} - 68 " "	1	-0.11862	-0.98472	-1.40395	15,000	-0.11862	-0.68173	-0.98551	5,626				
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	88												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	2					0.01614	0.67693	1.10851	21,881				
x_{26} - Male	86						Intercept		11,124				
Head of Family													
x_{27} - Not Head	13					-0.28528	-0.60961	-1.97891	6,046				
x_{28} - Head	75						Intercept		11,124				

Religion						
x_{29}- Protestant	3		0.01991	0.40258	0.90652	16,438
x_{30}- Jewish	0					
x_{31}- Other	4		-0.04300	-0.39385	-0.93271	7,766
x_{32}- Roman Catholic	81			Intercept		11,124
Race						
x_{33}- Black	0					
x_{34}- White	81			Intercept		11,124
x_{35}- Other	6		-0.02998	-0.10804	-0.63210	9,125
Children						
x_{36}- Has Children	64		0.26739	0.28332	1.21834	14,787
x_{37}- No Children	24			Intercept		11,124
Class of Activity						
x_{38}- Agriculture	0					
x_{39}- Extractive	0					
x_{40}- Mfg. Industry	0					
x_{41}- Commerce and Transportation	1		0.08136	-0.45328	-0.58951	7,090
x_{42}- Service Industries	0					
x_{43}- Government or Other	5			Intercept		11,124
x_{44}- Liberal Professions	40		0.14584	-0.51068	-1.12236	6,875
x_{45}- Social Services	42		-0.13228	-0.00597	-0.01766	11,057
Position						
x_{46}- Public Employee	42			Intercept		11,124
x_{47}- Employer or Own Account	44		0.22936	0.73417	2.37492	23,226
x_{48}- Private Employee	2		0.01616	0.17081	0.30210	13,189
Migration						
x_{49}- No Migration	28		0.12326	0.44720	2.59053	17,397
x_{50}- From Rural	2		0.04866	-0.07249	-0.13300	10,346
x_{51}- From Urban	58			Intercept		11,124
Environment						
x_{52}- Urban	85		0.13193	0.70833	0.91624	22,475
x_{53}- Suburban	2		-0.07628	0.33146	0.36065	15,495
x_{54}- Rural	1			Intercept		11,124
Analysis of Variance						
"F" Value		1.75311		1.49083		
$R^2(\bar{R}^2)$		.11493 (.06097)		.12173 (.11927)		
Std. Error of Estimate		0.68526		0.66456		

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Table 36 conta
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THE NORTH REGION STUDY

Table 36 contains the comparisons of total population and the employed sample used in the study. The aggregate is close to the twenty-five percent sample standard with secondary graduates slightly higher (27.6 percent) and the university group somewhat lower (22.2 percent). The States of Amazonas and Pará contain almost ninety percent of the region's total population and over ninety percent of its university graduates. Table 37 lists the variable key and observations in each cell.

The regressions of log income using the total sample are contained in Table 38. Approximately one-third of this sample consists of university graduates whereas in Espírito Santo only twenty-three percent of the total were university trained. Adding Years Completed to the regression on Age variables adds approximately fourteen percent to the $\bar{R}^2$ in the North versus ten percent in Espírito Santo. The larger relative size of the university population probably accounts for most of this difference. Age alone accounts for only nineteen percent of income variance versus thirty-three percent in Espírito Santo. This lower level of explanation by the Age variables in the North is found in the sub-samples as well. Each Year Completed is consistent with increased earnings when compared to secondary graduates and those

Cen. Code	Course Completed
50	Philosophy
57	Fine Arts
60	Medicine
61	Pharmacy
62	Dentistry
63	Vet. Medicine
64	Engineering
65	Architecture
66	Ind. Chemistry
67	Law
68	Agronomy
70	Econ./Pol. Sci.
71	Statistics
73	Sanitary Serv.
74	Military
76	Phys. Education
78	Seminary
-	Other Courses
Total University	
Employed Sec. Group	
Grand Totals	

[a] Brazil, Fundação Nacional de Recenseamento

[b] Brazil, Fundação Nacional de Recenseamento

TABLE 36

BRAZIL, NORTH REGION
POPULATION AND SAMPLE COMPOSITION

Cen. Code	Course Completed	State or Territory						Total Pop.[a]	Empl. Sample[b]	Percent
		RON	ROR	AMA	AC	AM	PA			
50	Philosophy	9	2	11	8	72	176	278	53	19.1
57	Fine Arts						2	2	*	-
60	Medicine	19	6	18	21	106	507	677	148	21.9
61	Pharmacy	5	1	7	8	34	162	217	39	18.0
62	Dentistry	8	5	14	18	101	324	470	121	25.7
63	Vet. Medicine	2	3	4		9	47	65	*	-
64	Engineering	19	6	35	13	113	469	655	171	26.1
65	Architecture	2		4		5	10	21	*	-
66	Ind. Chemistry	2		4		10	20	36	*	-
67	Law	9	5	22	20	406	805	1267	255	20.1
68	Agronomy	7	9	15	14	60	193	298	79	26.5
70	Econ./Pol. Sci.	2		2	1	13	111	129	29	22.5
71	Statistics						2	2	*	-
73	Sanitary Serv.			4		12	14	30	*	-
74	Military	7	2	6	8	48	328	399	*	-
76	Phys. Education	1						1	*	-
78	Seminary	11	26	15	16	96	168	332	*	-
-	Other Courses			1		9	16	26	192	-
Total University		103	65	162	127	1094	3354	4905	1,087	22.2
Employed Sec. Group		153	54	264	257	2110	5099	7937	2,189	27.6
Grand Totals		256	119	426	384	3204	8453	12,842	3,276	25.5

[a]Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, Censo Demográfico de 1960. (Rio de Janeiro: 1967).

[b]Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, VII Recenseamento Geral do Brasil 1960, 25 Percent Sample.

TABLE 37

VARIABLE KEY AND SAMPLE COMPOSITION

BRAZIL, NORTH REGION - 1960 CENSUS DATA

Variable Number and Description	SAMPLE COMPOSITION																		
	Total	Total univ.	Total second.	1 yr. univ.	2 yrs. univ.	3 yrs. univ.	4 yrs. univ.	5 yrs. univ.	6 yrs. univ.	Phil.	Medic.	Pharm.	Dent.	Engin.	Law	Agron.	Econ. Pol.Sc.	Other Univ. Courses
Years of University Completed																		
z_1 - 1 year	53	1	52	53	0	0	0	0	0	1	0	0	0	0	0	0	0	0
z_2 - 2 years	53	0	53	0	53	0	0	0	0	0	0	0	0	0	0	0	0	0
z_3 - 3 "	265	242	23	0	0	265	0	0	0	6	0	14	73	0	0	0	0	149
z_4 - 4 "	276	252	24	0	0	0	276	0	0	46	0	21	47	0	0	79	29	30
z_5 - 5 "	439	434	5	0	0	0	0	439	0	0	1	0	0	170	253	0	0	10
z_6 - 6 "	152	152	0	0	0	0	0	0	152	0	146	4	1	0	1	0	0	0
Age																		
z_7 - 19 years midpoint	56	0	56	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
z_8 - 22 " "	523	43	480	14	19	25	19	13	1	2	1	3	3	9	3	2	2	18
z_9 - 27 " "	689	176	513	11	13	97	44	61	23	15	22	6	16	27	31	7	4	48
z_{10} - 32 " "	594	213	381	7	6	44	40	107	26	8	26	5	22	43	62	10	7	30
z_{11} - 39 " "	765	319	446	8	9	73	68	134	49	17	45	8	38	53	81	18	5	54
z_{12} - 49 " "	401	204	197	7	4	34	41	70	41	5	41	9	27	18	47	27	6	24
z_{13} - 59 " "	162	82	80	1	2	11	31	33	9	4	10	6	7	10	20	8	4	13
z_{14} - 68 " "	86	50	36	0	0	11	13	21	3	2	3	2	8	11	11	7	1	5
Course Completed																		
z_{15} - Secondary	2189	0	2189	52	53	23	24	5	0	0	0	0	0	0	0	0	0	0
z_{16} - Philosophy	53	53	0	1	0	6	46	0	0	53	0	0	0	0	0	0	0	0
z_{17} - Medicine	148	148	0	0	0	0	0	1	146	0	148	0	0	0	0	0	0	0
z_{18} - Pharmacy	39	39	0	0	0	14	21	0	4	0	0	39	0	0	0	0	0	0
z_{19} - Dentistry	121	121	0	0	0	73	47	0	1	0	0	0	121	0	0	0	0	0
z_{20} - Engineering	171	171	0	0	0	0	0	170	0	0	0	0	0	171	0	0	0	0
z_{21} - Law	255	255	0	0	0	0	0	253	1	0	0	0	0	0	255	0	0	0
z_{22} - Agronomy	79	79	0	0	0	0	79	0	0	0	0	0	0	0	0	79	0	0
z_{23} - Econ./Pol. Science	29	29	0	0	0	0	29	0	0	0	0	0	0	0	0	0	29	0
z_{24} - All other courses completed except Seminary	192	192	0	0	0	149	30	10	0	0	0	0	0	0	0	0	0	192
Sex																		
z_{25} - Female	870	86	784	7	9	24	34	17	13	14	13	10	12	2	16	1	3	15
z_{26} - Male	2405	1000	1405	46	44	211	242	422	139	39	135	29	109	169	239	78	26	176
Head of Family																		
z_{27} - Not Head	1298	191	1103	22	30	46	65	82	21	17	21	11	24	34	46	9	9	20
z_{28} - Head	1977	893	1084	31	23	218	211	356	131	36	127	28	97	137	208	70	20	170

Religion																		
z_{29}- Protestant	123	55	68	2	4	9	29	16	1	14	2	5	3	13	3	8	0	7
z_{30}- Jewish	34	9	25	0	1	0	2	6	2	1	2	0	0	3	3	0	0	0
z_{31}- Other	195	90	105	3	2	21	29	38	5	6	4	2	5	12	21	13	4	23
z_{32}- Roman Catholic	2924	933	1991	48	46	235	216	379	144	32	140	32	113	143	228	58	25	102
Race																		
z_{33}- Black	26	1	25	0	2	1	0	0	0	0	0	0	0	0	0	0	0	1
z_{34}- White	2231	823	1408	29	39	221	188	335	116	45	114	30	87	136	191	39	19	104
z_{35}- Other	1019	263	756	24	12	43	88	104	36	8	34	9	34	35	64	40	12	27
Children																		
z_{36}- Has Children	1841	757	1084	19	19	170	179	310	113	24	109	27	93	115	186	64	20	119
z_{37}- No Children	1435	330	1105	34	34	95	97	129	39	29	39	12	28	56	69	15	9	73
Class of Activity																		
z_{38}- Agriculture	65	35	30	0	1	2	25	6	0	1	0	0	1	1	2	19	0	11
z_{39}- Extractive	104	42	62	1	2	5	16	25	1	3	1	1	0	23	2	5	2	5
z_{40}- Mfg. Industry	210	56	154	7	2	2	10	47	0	1	0	2	1	39	6	1	1	5
z_{41}- Commerce, Transportation	930	130	800	23	23	19	66	49	4	7	3	24	8	17	31	14	18	8
z_{42}- Service Industries	62	9	53	1	1	4	5	2	0	0	0	0	1	2	0	1	1	4
z_{43}- Government or Other	793	349	444	12	11	150	63	140	18	2	17	3	18	29	108	30	2	140
z_{44}- Liberal Professions	473	306	167	1	5	57	36	142	74	2	73	2	76	55	84	4	4	6
z_{45}- Social Services	637	160	477	8	8	26	55	28	55	37	54	7	16	5	22	5	1	13
Position																		
z_{46}- Public Employee	1431	493	938	21	19	166	101	184	70	12	68	10	37	52	126	36	4	148
z_{47}- Employer or Own Account	695	377	318	6	9	66	95	150	73	9	72	18	78	50	93	23	11	23
z_{48}- Private Employee	1149	217	932	26	25	33	80	105	9	32	8	11	6	69	36	20	14	21
Migration																		
z_{49}- No Migration	2099	589	1510	35	36	123	139	270	88	19	88	21	68	97	168	35	18	75
z_{50}- From Rural	113	37	76	7	2	8	12	13	5	2	4	0	6	6	7	3	1	8
z_{51}- From Urban	1052	455	597	11	15	133	124	155	57	31	54	18	47	68	79	41	10	107
Environment																		
z_{52}- Urban	2530	841	1666	31	44	193	195	376	140	34	138	33	103	135	235	45	24	117
z_{53}- Suburban	511	122	389	20	7	53	37	27	10	14	8	6	12	12	13	10	4	43
z_{54}- Rural	225	97	128	2	2	19	42	35	2	4	2	0	6	23	7	23	1	31

TABLE 38

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE

Variable Number and Description	Sample Size	Regression nº 1				Regression nº2				Regression nº3			
		Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Ins.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Ins.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Ins.
Years of University Completed													
							Intercept		16,507		Intercept		16,473
z_1 - 1 year	53					-0.03659	0.11285	1.14930	18,479	-0.03659	0.07290	0.77089	17,719
z_2 - 2 years	53					0.16248	0.65222	14.09220	31,690	0.16248	0.66438	14.26031	32,012
z_3 - 3 years	265					0.07308	0.32493	7.05875	22,845	0.07308	0.36310	8.08015	23,684
z_4 - 4 years	276					0.31384	0.78743	20.71097	36,278	0.31384	0.75810	19.67667	35,157
z_5 - 5 years	439					0.21993	0.92990	15.46521	41,833	0.21993	1.05899	17.46069	47,499
z_6 - 6 years	152												
Age													
z_7 - 19 years midpoint	56	-0.16254	-1.37586	-12.81987	5,573	-0.16254	-1.08592	-11.05168	5,573	-0.16254	-1.00923	-10.65682	6,004
z_8 - 22 " "	523	-0.32152	-0.94907	-21.57538	8,539	-0.32152	-0.72755	-17.75645	7,974	-0.32152	-0.64080	-16.03039	8,679
z_9 - 27 " "	689	-0.12349	-0.51925	-12.75117	13,125	-0.12349	-0.41634	-11.16985	10,886	-0.12349	-0.37695	-10.45049	11,300
z_{10} - 32 " "	594	0.05194	-0.21761	- 5.13258	17,745	0.05194	-0.18153	-4.70346	13,767	0.05194	-0.14939	-4.00706	14,187
z_{11} - 39 " "	765		Intercept		22,099		Intercept		16,507		Intercept		16,473
z_{12} - 49 " "	401	0.16863	0.07664	1.60344	23,817	0.16863	0.02821	0.64685	16,979	0.16863	0.03165	0.74916	17,003
z_{13} - 59 " "	162	0.08728	0.01724	0.25720	22,443	0.08728	-0.01271	-0.20792	16,298	0.08728	-0.00562	-0.09537	16,380
z_{14} - 68 " "	86	0.06420	-0.02444	0.27724	22,605	0.06420	-0.04287	-0.53397	15,814	0.06420	-0.03483	-0.44989	15,909
Course Completed													
z_{15}- Secondary	2189												
z_{16}- Philosophy	53												
z_{17}- Medicine	148												
z_{18}- Pharmacy	39												
z_{19}- Dentistry	121												
z_{20}- Engineering	171												
z_{21}- Law	255												
z_{22}- Agronomy	79												
z_{23}- Econ./Fol. Science	29												
z_{24}- All other courses completed except Seminary	192												
Sex													
z_{25}- Female	870												
z_{26}- Male	2495												
Head of Family													
z_{27}- Not Head	1294												
z_{28}- Head	1977												

Religion				
z_{29}- Protestant	125			
z_{30}- Jewish	34			
z_{31}- Other	197			
z_{32}- Roman Catholic	2084			
Race				
z_{33}- Black	26			
z_{34}- White	2231			
z_{35}- Other	1089			
Children				
z_{36}- Has Children	1841			
z_{37}- No Children	1435			
Class of Activity				
z_{38}- Agriculture	65			-0.02496 -0.30648 -3.42806 12.125
z_{39}- Extractive	108			0.11143 0.42091 5.91575 25.094
z_{40}- Mfg. Industry	210			0.05898 0.18018 3.37564 19.725
z_{41}- Commerce and Transportation	930			-0.00600 0.10363 3.01411 18.272
z_{42}- Service Industries	62			-0.08824 -0.42061 -4.67371 10.817
z_{43}- Government or Other	793			intercept 16.473
z_{44}- Liberal Professions	473			0.15186 -0.03751 -0.92347 15.866
z_{45}- Social Services	637			-0.26691 -0.35320 -9.38722 11.571
Position				
z_{46}- Public Employee	1431			
z_{47}- Employer or Own Account	695			
z_{48}- Private Employee	1149			
Migration				
z_{49}- No Migration	2099			
z_{50}- From Rural	113			
z_{51}- From Urban	1052			
Environment				
z_{52}- Urban	2530			
z_{53}- Suburban	511			
z_{54}- Rural	225			
Analysis of Variance				
"F" Value		112.38662	136.97778	107.49785
R^2 ($\bar{R}^2$)		.19402 (.19255)	.33499 (.33275)	.38518 (.38209)
Std. Error of Estimate		0.77925	0.70473	0.67818

TABLE 38
BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE (Cont.)

Variable Number and Description	Sample Size	Regression nº4				Regression nº5				Regression nº6			
		Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	53		Intercept		14,750								
x_2 - 2 years	53	-0.03659	-0.00927	-0.10620	14,614								
x_3 - 3 years	265	0.16248	0.14562	10.33264	23,497								
x_4 - 4 years	276	0.07308	0.21101	5.61965	18,778								
x_5 - 5 years	139	0.11381	0.58736	15.76499	26,539								
x_6 - 6 years	152	0.21993	0.79481	13.59398	32,657								
Age													
x_7 - 19 years midpoint	56	-0.16254	-0.57624	-6.24369	8,290					-0.16254	-1.28154	-12.42257	6,979
x_8 - 22 " "	523	-0.32152	-0.29513	-6.81008	10,978					-0.32152	-0.84720	-19.77531	10,158
x_9 - 27 " "	689	-0.12349	-0.13762	-4.29120	12,799					-0.12349	-0.47309	-12.03970	14,766
x_{10} - 32 " "	594	0.05194	-0.01680	-1.31985	14,075					0.05194	-0.19146	-4.69017	19.570
x_{11} - 39 " "	765		Intercept		14,750						Intercept		23,699
x_{12} - 49 " "	401	0.16843	-0.00105	-0.02662	14,734					0.16843	0.09167	1.98426	25,971
x_{13} - 79 " "	162	0.08728	-0.08857	-1.59323	13,700					0.08728	0.00695	0.10775	23,865
x_{14} - 88 " "	86	0.06420	-0.12099	-1.65774	13,069					0.06420	0.00031	0.00372	23,707
Course Completed													
x_{15} - Secondary	2189												
x_{16} - Philosophy	53												
x_{17} - Medicine	148												
x_{18} - Pharmacy	39												
x_{19} - Dentistry	121												
x_{20} - Engineering	171												
x_{21} - Law	255												
x_{22} - Agronomy	79												
x_{23} - Econ./Pol. Science	29												
x_{24} - All other courses completed except Seminary	192												
Sex													
x_{25} - Female	870	-0.48027	-0.32159	-9.22012	10,662								
x_{26} - Male	2405		Intercept		14,750								
Head of Family													
x_{27} - Not Head	1794	-0.19398	-0.29455	-8.76825	10,987								
x_{28} - Head	1977		Intercept		14,750								

Religion														
x_{29}- Protestant	123		intercept		14.730									
x_{30}- Jewish	34		intercept		14,730									
x_{31}- Other	195		intercept		14,730									
x_{32}- Roman Catholic	2924	-0.05998	-0.04513	-1.21684	14.099									
Race														
x_{33}- Black	26		intercept		14.730									
x_{34}- White	2231	0.15443	0.09193	3.74871	16,170									
x_{35}- Other	1019		intercept		14,730									
Children														
x_{36}- Has Children	1841	0.34870	0.09233	3.27932	16,177									
x_{37}- No Children	1435		intercept		14,730									
Class of Activity														
x_{38}- Agriculture	65	-0.02496	-0.28605	-2.98358	11,080	-0.02496	-0.28104	-2.66843	13,868	-0.02496	-0.43568	-4.49919	15,329	
x_{39}- Extractive	104	0.11143	0.38184	5.01384	21,608	0.11143	0.40118	4.71183	27,434	0.11143	0.38366	4.96048	34,982	
x_{40}- Mfg. Industry	210	0.05898	0.13453	2.34567	16,874	0.05898	0.06468	1.02112	19,596	0.05898	0.06160	1.06610	25,295	
x_{41}- Commerce and Transportation	930	-0.00600	0.05701	1.24659	15,615	-0.00600	-0.13791	-3.49717	16,002	-0.00600	-0.12003	-3.33275	21,019	
x_{42}- Service Industries	62	-0.08824	-0.40257	-4.34964	9,862	-0.08824	-0.67771	-6.29507	9,327	-0.08824	-0.62390	-6.35814	12,699	
x_{43}- Government or Other	793		intercept		14,730		intercept		18,368		intercept		23,699	
x_{44}- Liberal Professions	473	0.15186	-0.03946	-0.72698	14.179	0.15186	0.18915	3.98989	22,193	0.15186	0.13691	3.16105	27,177	
x_{45}- Social Services	637	-0.26691	-0.15877	-4.15733	12,584	-0.26691	-0.59831	-13.77973	10,098	-0.26691	-0.44277	-11.04034	15,221	
Position														
x_{46}- Public Employee	1431	-0.09310	0.05198	1.33818	15.537									
x_{47}- Employer or Own Account	695	0.23311	0.14243	4.11621	17.008									
x_{48}- Private Employee	1149		intercept		14,730									
Migration														
x_{49}- No Migration	2099	-0.16354	-0.08947	-3.52685	13,487									
x_{50}- From Rural	113	-0.00353	-0.06449	-1.01953	13,829									
x_{51}- From Urban	1052		intercept		14,730									
Environment														
x_{52}- Urban	2530	0.11720	0.22050	4.51016	18,389									
x_{53}- Suburban	511	-0.13831	0.00135	0.02477	14,770									
x_{54}- Rural	225		intercept		14,730									
Analysis of Variance														
"F" Value			92.78234			55.45133				81.59710				
R^2 (R^2)			.46172 (.45692)			.10617 (.10454)				.25943 (.25649)				
Std. Error of Estimate			0.63579			0.81641				0.74392				

TABLE 38

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE (Cont.)

Variable Number and Description	Sample Size	Regression nº7				Regression nº8				Regression nº			
		Simp.Corr. Coef.	Regr. Coef.	"a" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"a" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"a" Value	Antilog log.Inc.
Years of University Completed													
x_1 - 1 year	53												
x_2 - 2 years	53												
x_3 - 3 years	265												
x_4 - 4 years	276												
x_5 - 5 years	439												
x_6 - 6 years	152												
Age													
x_7 - 19 years midpoint	56												
x_8 - 22 " "	523												
x_9 - 27 " "	689												
x_{10} - 34 " "	594												
x_{11} - 39 " "	769												
x_{12} - 49 " "	401												
x_{13} - 59 " "	142												
x_{14} - 68 " "	86												
Course Completed													
x_{15} - Secondary	2189												
x_{16} - Philosophy	53												
x_{17} - Medicine	148												
x_{18} - Pharmacy	39												
x_{19} - Dentistry	121												
x_{20} - Engineering	171												
x_{21} - Law	255												
x_{22} - Agronomy	79												
x_{23} - Econ./Pol. Science	29												
x_{24} - All other courses completed except Seminary	192												
Sex													
x_{25} - Female	870												
x_{26} - Male	2,405												
Head of Family													
x_{27} - Not Head	1294												
x_{28} - Head	1977												

Religion					
x_{29}- Protestant	123				
x_{30}- Jewish	34				
x_{31}- Other	195				
x_{32}- Roman Catholic	2924				
Race					
x_{33}- Black	26				
x_{34}- White	2231				
x_{35}- Other	1019				
Children					
x_{36}- Has Children	1841				
x_{37}- No Children	1435				
Class of Activity					
x_{38}- Agriculture	65				
x_{39}- Extractive	104				
x_{40}- Mfg. Industry	210				
x_{41}- Commerce and Transportation .	930				
x_{42}- Service Industries	62				
x_{43}- Government or Other	793				
x_{44}- Liberal Professions	473				
x_{45}- Social Services	637				
Position					
x_{46}- Public Employee	1431				
x_{47}- Employer or Own Account . . .	695				
x_{48}- Private Employee	1149				
Migration					
x_{49}- No Migration	2099	-0.16354	-0.31565	-9.86972	14,517
x_{50}- From Rural	113	-0.00353	-0.22615	-2.68809	15,876
x_{51}- From Urban	1052	intercept			19,905
Environment					
x_{52}- Urban	2530			0.11720 0.04243 0.72821	17,044
x_{53}- Suburban	511			-0.13831 -0.28995 -4.30506	12,228
x_{54}- Rural	225			intercept	16, 336
Analysis of Variance					
"F" Value		48.68736		32.18883	
$R^2(\bar{R}^2)$.		.02889 (.02860)		.01929 (.01900)	
Std. Error of Estimate . . .		0.85052		0.85451	

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scores than Governm

completing one year of university. There is an anomaly in the step-wise increases between each Year Completed at the four-year level. These individuals earn more than their two-year counterparts but less than the three-year graduates. The large portion of Philosophy graduates in this sub-sample is the primary reason for the comparatively low income. In the North Region, Philosophy graduates have absolute lifetime earnings less than secondary graduates. Maximum explained variance with all variables is forty-six percent which is less than in Espírito Santo by about the difference in the variance explained by Age.

All University Graduates.--Table 39 contains the results of the regressions using the sample of All University Graduates. Almost no interdependence exists between Age and Years Completed variables which together have an $\bar{R}^2$ of .110. Course Completed explains twelve percent of income variance--the same as in Espírito Santo. Again, there is no interdependence between Age and Course Completed (.14872 together versus .14855 separately). A maximum explained variance of twenty-two percent results from the regression of all variables together. Although Class of Activity explains more than in Espírito Santo, it still accounts for less than six percent of total variance. Unlike Espírito Santo, income variance within Class of Activity is considerable. Manufacturing and Extractive Industries show significantly higher incomes than Government and Liberal Professions which, in

TABLE 39

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1 Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Regression nº 2 Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Regression nº 3 Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	1					intercept			26,843	intercept			31,210
x_2 - 2 years	0												
x_3 - 3 years	262					intercept			26,843	intercept			31,210
x_4 - 4 years	252					-0.25612	-0.29,60	-4.56781	19,993	-0.25612	-0.33112	-5.16109	22,368
x_5 - 5 years	434					0.18827	0.18997	3.31086	32,459	0.18827	0.11322	2.19753	34,016
x_6 - 6 years	152					0.15757	0.35109	4.72571	38,134	0.15757	0.29053	3.91430	41,732
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	43	-0.13298	-0.62167	-5.18604	17,139					-0.13298	-0.59151	-4.65443	18,160
x_9 - 27 " "	176	-0.11031	-0.32009	-4.59759	23,713					-0.11031	-0.30938	-4.55383	22,985
x_{10} - 32 " "	213	0.02065	-0.09948	-1.51638	29,317					0.02065	-0.11055	-1.75276	27,944
x_{11} - 39 " "	119	intercept			32,384					intercept			31,210
x_{12} - 49 " "	204	0.03827	-0.07727	-1.16251	29,976					0.03827	-0.08992	-0.77882	29,690
x_{13} - 59 " "	82	-0.01118	-0.16041	-1.83151	27,344					-0.01118	-0.09334	-1.07334	28,529
x_{14} - 68 " "	50	-0.01101	-0.16080	-1.49685	27,354					-0.01101	-0.12286	-1.13340	27,602
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	53												
x_{17} - Medicine	148												
x_{18} - Pharmacy	39												
x_{19} - Dentistry	121												
x_{20} - Engineering	171												
x_{21} - Law	255												
x_{22} - Agronomy	79												
x_{23} - Econ./Pol. Science	29												
x_{24} - All other courses completed except Seminary	192												
Sex													
x_{25} - Female	86												
x_{26} - Male	1000												
Head of Family													
x_{27} - Not Head	191												
x_{28} - Head	893												

Religion				
x_{29}- Protestant	55			
x_{30}- Jewish	8			
x_{31}- Other	96			
x_{32}- Roman Catholic	933			
Race				
x_{33}- Black	1			
x_{34}- White	823			
x_{35}- Other	268			
Children				
x_{36}- Has Children	757			
x_{37}- No Children	330			
Class of Activity				
x_{38}- Agriculture	35			
x_{39}- Extractive	42			
x_{40}- Mfg. Industry	56			
x_{41}- Commerce and Transportation	130			
x_{42}- Service Industries	9			
x_{43}- Government or Other	349			
x_{44}- Liberal Professions	306			
x_{45}- Social Services	160			
Position				
x_{46}- Public Employee	493			
x_{47}- Employer or Own Account	377			
x_{48}- Private Employee	217			
Migration				
x_{49}- No Migration	589			
x_{50}- From Rural	37			
x_{51}- From Urban	455			
Environment				
x_{52}- Urban	864			
x_{53}- Suburban	122			
x_{54}- Rural	97			
Analysis of Variance				
"F" Value		7.04323	33.77294	15.73011
R^2 ($\bar{R}^2$)		.08766 (.03143)	.08954 (.08386)	.11617 (.10962)
Std. Error of Estimate		0.71145	0.72176	0.71154

TABLE 39

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 4				Regression nº 5				Regression nº 6			
		Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Reg.Coe.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Reg.Coe.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Reg.Coe.
Years of University Completed													
x_1 - 1 year	1		intercept		45,436								
x_2 - 2 years	0												
x_3 - 3 years	262		intercept		45,436								
x_4 - 4 years	252	-0.25612	-0.16431	-2.48755	38,551								
x_5 - 5 years	434	0.18627	0.10738	1.86346	50,587								
x_6 - 6 years	152	0.15797	0.34317	4.54209	64,098								
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	43	-0.13298	-0.28408	-2.40158	34,184					-0.13298	-0.67042	-5.75354	18,358
x_9 - 27 " "	176	-0.11031	-0.16365	-2.36718	38,577					-0.11031	-0.34661	-5.12787	25,378
x_{10} - 32 " "	213	0.02064	-0.08192	-1.35562	41,862					0.02064	-0.13237	-2.08453	31,401
x_{11} - 39 " "	319		intercept		45,436						intercept		35,891
x_{12} - 49 " "	204	0.03427	-0.04147	-0.67731	43,590					0.03427	-0.04185	-0.69105	34,317
x_{13} - 59 " "	82	-0.01118	-0.11698	-1.71962	39,304					-0.01118	-0.17287	-1.94419	30,193
x_{14} - 68 " "	50	-0.01101	-0.12609	-1.22886	40,093					-0.01101	-0.14113	-1.50934	39,498
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	53												
x_{17} - Medicine	148												
x_{18} - Pharmacy	39												
x_{19} - Dentistry	121												
x_{20} - Engineering	171												
x_{21} - Law	255												
x_{22} - Agronomy	79												
x_{23} - Econ./Pol. Science	89												
x_{24} - All other courses completed except Seminary	192												
Sex													
x_{25} - Female	86	-0.25119	-0.30501	-3.45956	33,492								
x_{26} - Male	1000		intercept		45,436								
Head of Family													
x_{27} - Not Head	191	-0.21980	-0.30300	-4.61818	33,559								
x_{28} - Head	893		intercept		45,436								

Religion												
x_{29}- Protestant	55	-0.00753	-0.28139	-1.14118	34,292							
x_{30}- Jewish	9		intercept		45,436							
x_{31}- Other	90	-0.02195	-0.40795	-1.71297	30,215							
x_{32}- Roman Catholic	933	0.00376	-0.41279	-1.81847	30,070							
Race												
x_{33}- Black	1	-0.02572	0.36026	0.52249	65,142							
x_{34}- White	823		intercept		45,436							
x_{35}- Other	243	-0.09678	-0.11584	-2.35859	40,466							
Children												
x_{36}- Has Children	757		intercept		45,436							
x_{37}- No Children	330	-0.17064	-0.07410	-1.43098	42,191							
Class of Activity												
x_{38}- Agriculture	35	-0.10943	-0.10342	-0.69175	40,972	-0.10943	0.52487	-4.04735	18,077	-0.10943	-0.59417	-4.60390	19,813
x_{39}- Extractive	42	0.07502	0.44969	3.37113	71,237	0.07502	0.20911	1.75056	37,660	0.07502	0.21247	1.81477	44,388
x_{40}- Mfg. Industry	56	0.08024	0.28672	2.57129	60,524	0.08024	0.18656	1.77199	36,821	0.08024	0.16231	1.57239	42,217
x_{41}- Commerce and Transportation	130	-0.07241	-0.01035	-0.10647	44,968	-0.07241	-0.22086	-2.93890	24,499	-0.07241	-0.27088	-3.65685	27,374
x_{42}- Service Industries	9	-0.11106	-0.66130	-2.74593	23,453	-0.11106	-0.98860	-4.00373	11,369	-0.11106	-1.08749	-4.48895	12,098
x_{43}- Government or Other	349		intercept		45,436		intercept		30,554		intercept		35,091
x_{44}- Liberal Professions	306	0.08569	0.18666	1.83347	54,761	0.08569	0.03031	0.52916	31,494	0.08569	-0.00729	-0.12907	35,631
x_{45}- Social Services	160	-0.13801	-0.24467	-3.32990	35,575	-0.13801	-0.32312	-4.62714	22,117	-0.13801	-0.34131	-4.98086	25,513
Position												
x_{46}- Public Employee	493		intercept		45,436							
x_{47}- Employer or Own Account	377	-0.01287	-0.24380	-2.66293	35,606							
x_{48}- Private Employee	217	-0.05778	-0.14738	-1.84170	39,210							
Migration												
x_{49}- No Migration	589	-0.01069	-0.03770	-0.84504	43,755							
x_{50}- From Rural	37	-0.00439	0.00877	0.07599	45,837							
x_{51}- From Urban	455		intercept		45,436							
Environment												
x_{52}- Urban	864	0.13611	0.22204	2.72831	56,733							
x_{53}- Suburban	122	-0.09018	0.04221	0.43273	47,395							
x_{54}- Rural	97		intercept		45,436							
Analysis of Variance												
"F" Value		10.70593				10.62464				10.07407		
$R^2(\bar{R}^2)$		.23321	(.21218)			.06648	(.05929)			.10877	(.09882)	
Std. Error of Estimate		0.66932				0.73138				0.71585		

TABLE 39

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 7				Regression nº 8				Regression nº 9			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	1												
z_2 - 2 years	0												
z_3 - 3 years	242												
z_4 - 4 years	252												
z_5 - 5 years	434												
z_6 - 6 years	152												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	43												
z_9 - 27 " "	176												
z_{10} - 32 " "	213												
z_{11} - 39 " "	319												
z_{12} - 49 " "	204												
z_{13} - 59 " "	82												
z_{14} - 68 " "	50												
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	53												
z_{17} - Medicine	148												
z_{18} - Pharmacy	39												
z_{19} - Dentistry	121												
z_{20} - Engineering	171												
z_{21} - Law	255												
z_{22} - Agronomy	79												
z_{23} - Econ./Pol. Science	29												
z_{24} - All other courses completed except Seminary	192												
Sex													
z_{25} - Female	86												
z_{26} - Male	1000												
Head of Family													
z_{27} - Not Head	191												
z_{28} - Head	893												

Religion				
x_{29}- Protestant	55			
x_{30}- Jewish	9			
x_{31}- Other	90			
x_{32}- Roman Catholic	933			
Race				
x_{33}- Black	1			
x_{34}- White	823			
x_{35}- Other	268			
Children				
x_{36}- Has Children	757			
x_{37}- No Children	330			
Class of Activity				
x_{38}- Agriculture	35			
x_{39}- Extractive	42			
x_{40}- Mfg. Industry	56			
x_{41}- Commerce and Transportation .	130			
x_{42}- Service Industries	9			
x_{43}- Government or Other	349			
x_{44}- Liberal Professions	306			
x_{45}- Social Services	160			
Position				
x_{46}- Public Employee	493			
x_{47}- Employer or Own Account . . .	377			
x_{48}- Private Employee	217			
Migration				
x_{49}- No Migration	589		-0.01069 -0.01628 -0.38978 28,198	-0.01069 -0.06191 -1.30409 21,944
x_{50}- From Rural	37		-0.00439 -0.02852 -0.22126 27,911	0.00439 -0.04157 -0.32581 22,395
x_{51}- From Urban	455		intercept 28,718	intercept 23,346
Environment				
x_{52}- Urban	864	0.13611 0.26693 3.39676 29,927		0.13611 0.28622 3.57680 31,083
x_{53}- Suburban	122	-0.09018 0.02374 0.23615 23,466		-0.09018 0.03289 0.32623 24,127
x_{54}- Rural	97	intercept 22,916		intercept 23,346
Analysis of Variance				
"F" Value		10.26030	0.08644	5.55485
R^2 ($\bar{R}^2$)		.01858 (.01768)	.00016 (<0)	.02012 (.01741)
Std. Error of Estimate . . .		0.74738	0.75436	0.74768

TABLE 39

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 10				Regression nº 11				Regression nº 12			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	1												
x_2 - 2 years	0												
x_3 - 3 years	242												
x_4 - 4 years	252												
x_5 - 5 years	434												
x_6 - 6 years	152												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	43												
x_9 - 27 " "	176												
x_{10} - 32 " "	213												
x_{11} - 39 " "	319												
x_{12} - 49 " "	204												
x_{13} - 59 " "	82												
x_{14} - 68 " "	50												
Course Completed													
x_{15} - Secondary	0									-0.19723	-0.73937	-6.72502	14,736
x_{16} - Philosophy	53									0.14890	0.19954	2.57466	37,684
x_{17} - Medicine	148									-0.12417	-0.56797	-4.56385	17,491
x_{18} - Pharmacy	39									-0.13769	-0.37614	-4.57351	21,190
x_{19} - Dentistry	121									0.14042	0.16182	2.17207	36,289
x_{20} - Engineering	171									0.05647	-0.00617	-0.09124	30,677
x_{21} - Law	255									-0.11022	-0.37965	-4.00870	21,116
x_{22} - Agronomy	79									-0.05026	-0.31176	-2.20858	22,599
x_{23} - Econ./Pol. Science	29										Intercept		30,867
x_{24} - All other courses completed except Seminary	192												
Sex													
x_{25} - Female	86												
x_{26} - Male	1000												
Head of Family													
x_{27} - Not Head	191												
x_{28} - Head	893												

Religion								
x_{29}- Protestant	55	-0.00753	-0.60571	-2.23784	27,719			
x_{30}- Jewish	9		intercept		29,796			
x_{31}- Other	90	-0.02195	-0.63422	-2.41780	27,686			
x_{32}- Roman Catholic	933	0.00376	-0.58001	-2.30037	28,440			
Race								
x_{33}- Black	1					-0.02572	-0.68069	-0.90628	14,999
x_{34}- White	823						intercept		29,627
x_{35}- Other	263					-0.09678	-0.17109	-3.21799	24,987
Children								
x_{36}- Has Children	757							
x_{37}- No Children	330							
Class of Activity								
x_{38}- Agriculture	35							
x_{39}- Extractive	42							
x_{40}- Mfg. Industry	96							
x_{41}- Commerce and Transportation	130							
x_{42}- Service Industries	9							
x_{43}- Government or Other	349							
x_{44}- Liberal Professions	306							
x_{45}- Social Services	160							
Position								
x_{46}- Public Employee	493							
x_{47}- Employer or Own Account	377							
x_{48}- Private Employee	217							
Migration								
x_{49}- No Migration	589							
x_{50}- From Rural	37							
x_{51}- From Urban	455							
Environment								
x_{52}- Urban	849							
x_{53}- Suburban	122							
x_{54}- Rural	97							
Analysis of Variance								
"F" Value		1.96868				5.54007			18.86419
R^2 ($\bar{R}^2$)		.00542	(.00359)			.01012	(.00921)		.12280 (.11712)
Std. Error of Estimate		0.75272				0.75059			0.70854

TABLE 39

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL UNIVERSITY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 13				Regression nº 14				Regression nº			
		Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	1												
x_2 - 2 years	0												
x_3 - 3 years	262												
x_4 - 4 years	252												
x_5 - 5 years	434												
x_6 - 6 years	152												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	43	-0.13298	-0.62523	-5.45995	19.600	-0.13298	-0.33122	-2.84999	21,033				
x_9 - 27 " "	176	-0.11031	-0.31094	-4.72725	26,838	-0.11031	-0.16186	-2.35163	24,989				
x_{10} - 32 " "	213	0.02064	-0.11697	-1.89552	32,583	0.02064	-0.06979	-1.16277	27,399				
x_{11} - 39 " "	319		intercept		36,626		intercept		29,380				
x_{12} - 49 " "	204	0.03427	-0.04258	-0.67674	35,100	0.03427	-0.02409	-0.39131	28,680				
x_{13} - 59 " "	82	-0.01118	-0.12149	-1.10374	32,436	-0.01118	-0.15249	-1.81791	25,224				
x_{14} - 68 " "	50	-0.01101	-0.11173	-1.05119	32,754	-0.01101	-0.11846	-1.15504	26,098				
Course Completed													
x_{15} Secondary	0												
x_{16} Philosophy	53	-0.19723	-0.76379	-7.06123	17,064	-0.19723	-0.54391	-4.50310	17,054				
x_{17} Medicine	148	0.14890	0.12173	1.57527	41,368	0.14890	0.10367	1.20552	32,589				
x_{18} Pharmacy	39	-0.12417	-0.59388	-4.81033	20,224	-0.12417	-0.46131	-3.57566	18,523				
x_{19} Dentistry	121	-0.13769	-0.46542	-5.45679	23,161	-0.13769	-0.18464	-2.26921	18,161				
x_{20} Engineering	171	0.14842	0.12093	1.64051	41,334	0.14842	0.09916	0.74631	31,170				
x_{21} Law	255	0.05647	-0.08116	-1.20383	33,761	0.05647	-0.10167	-1.43311	26,510				
x_{22} Agronomy	79	-0.11022	-0.45579	-4.81762	23,219	-0.11022	-0.33114	-3.45237	21,892				
x_{23} Econ./Pol. Science	29	-0.05026	-0.33918	-2.63903	26,091	-0.05026	-0.21887	-1.53121	23,604				
x_{24} All other courses completed except Seminary	192		intercept		34,626		intercept		29,380				
Sex													
x_{25} Female	86					-0.25119	-0.31441	-3.58953	21,454				
x_{26} Male	1000						intercept		29,380				
Head of Family													
x_{27} Not Head	191					-0.24980	-0.28128	-4.32008	22,176				
x_{28} Head	893						intercept		29,380				

Religion						
x_{29}- Protestant	55		-0.00753	0.19531	1.32877	34,316
x_{30}- Jewish	9			intercept		29,380
x_{31}- Other	90			intercept		29,380
x_{32}- Roman Catholic	933		0.00376	-0.03148	-0.43248	28,669
Race						
x_{33}- Black	1			intercept		29,380
x_{34}- White	823		0.09848	0.09792	1.98682	32,482
x_{35}- Other	243			intercept		29,380
Children						
x_{36}- Has Children	757		-0.17064	-0.07905	-1.53747	27,146
x_{37}- No Children	330					
Class of Activity						
x_{38}- Agriculture	35		-0.10943	-0.26337	-1.89559	22,577
x_{39}- Extractive	42			intercept		29,380
x_{40}- Mfg. Industry	56		-0.08024	0.17515	1.63942	35,004
x_{41}- Commerce and Transportation	130		-0.07241	-0.04277	-0.48739	28,150
x_{42}- Service Industries	9			intercept		29,380
x_{43}- Government or Other	349			intercept		29,380
x_{44}- Liberal Professions	306		0.08569	0.15015	1.85428	34,140
x_{45}- Social Services	160		-0.13801	-0.13307	-1.78234	25,719
Position						
x_{46}- Public Employee	493		0.05870	0.08838	1.33338	32,095
x_{47}- Employer or Own Account	377			intercept		29,380
x_{48}- Private Employee	217			intercept		29,380
Migration						
x_{49}- No Migration	589		-0.01069	-0.04463	-1.00286	28,097
x_{50}- From Rural	37		-0.00439	-0.00371	-0.03228	29,271
x_{51}- From Urban	455			intercept		29,380
Environment						
x_{52}- Urban	864		0.13611	0.21957	2.73245	36,594
x_{53}- Suburban	122		-0.09018	0.00881	0.09196	29,640
x_{54}- Rural	97			intercept		29,380
Analysis of Variance						
"F" Value		14.46593	11.08627			
R^2 ($\bar{R}^2$)		.15890 (.14872)	.23951 (.21865)			
Std. Error of Estimate		0.69575	0.66656			

turn, have significantly higher incomes than Agriculture, Commerce/Transportation, Service Industries and Social Service.

The following income differences are significant at the ninety percent level or more: in comparison to Engineering. Law, Economics, and All Other Courses Completed; Pharmacy, Dentistry, Agronomy, and Philosophy earn much less; and Medicine more. Females have less income than Males, non-Heads of Family less than Heads of Family, non-Protestants less than Protestants, non-white less than White, and non-urban environment less than urban. Children, Position, and Migration variables do not produce significant earnings differences.

The age-income profile for All University Graduates is shown in Figures 32 and 33. Comparison with the secondary graduates shows the expected higher level, earlier peak, and faster increases in early earnings. The comparison with Espirito Santo in Figure 33 is interesting because of the general similarity of levels except for the considerably higher early income pattern). This faster recovery of educational investment could have significance in interregional distribution of both resources and skilled manpower.

All Secondary Graduates.--Table 40 contains nine regressions using the sample of All Secondary Graduates. As in Espirito Santo, the college drop-outs in this group show generally increased earnings compared with persons who had no university training. Significantly higher incomes exist

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Fig. 32

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960

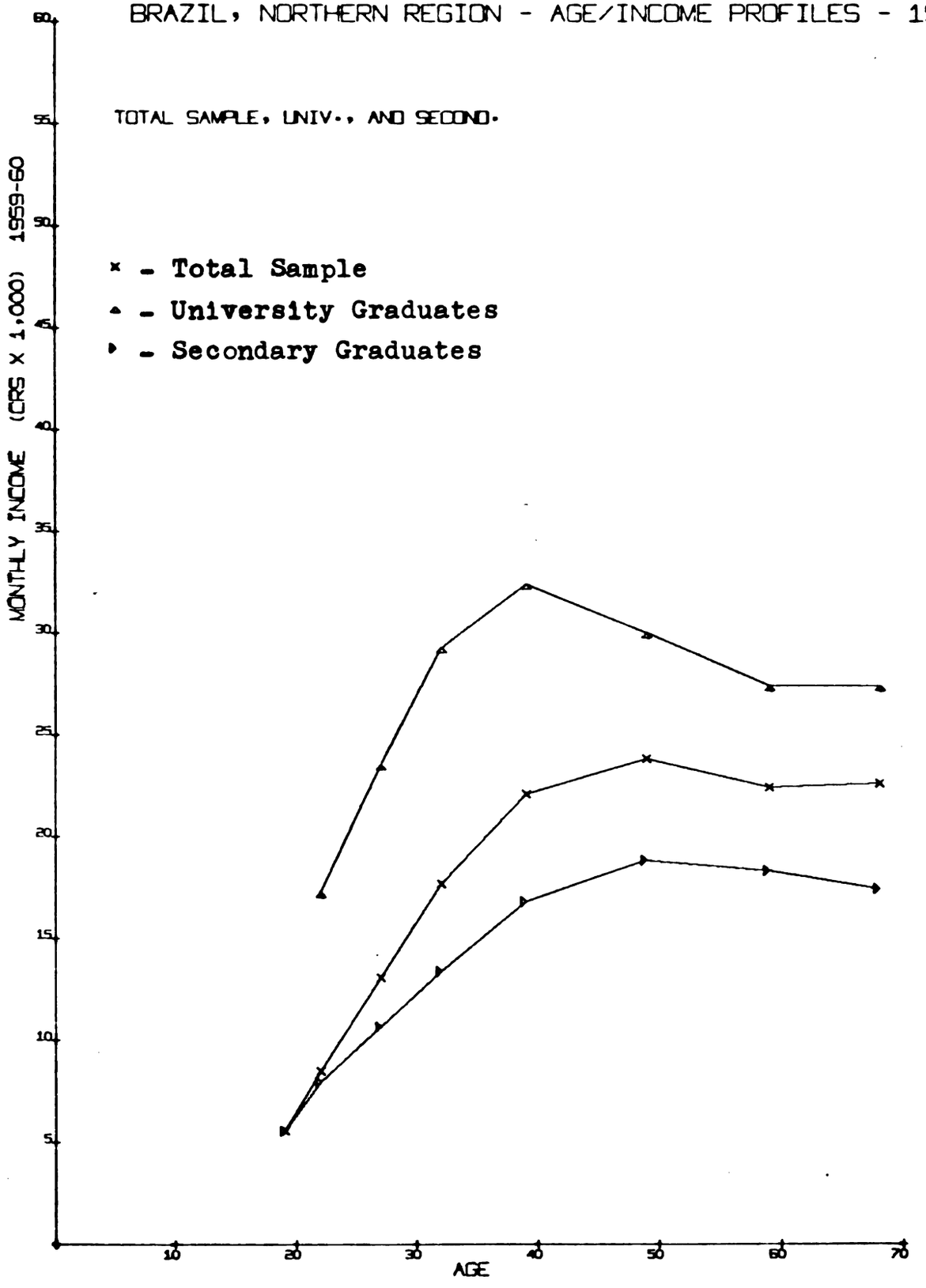




Fig. 33

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960

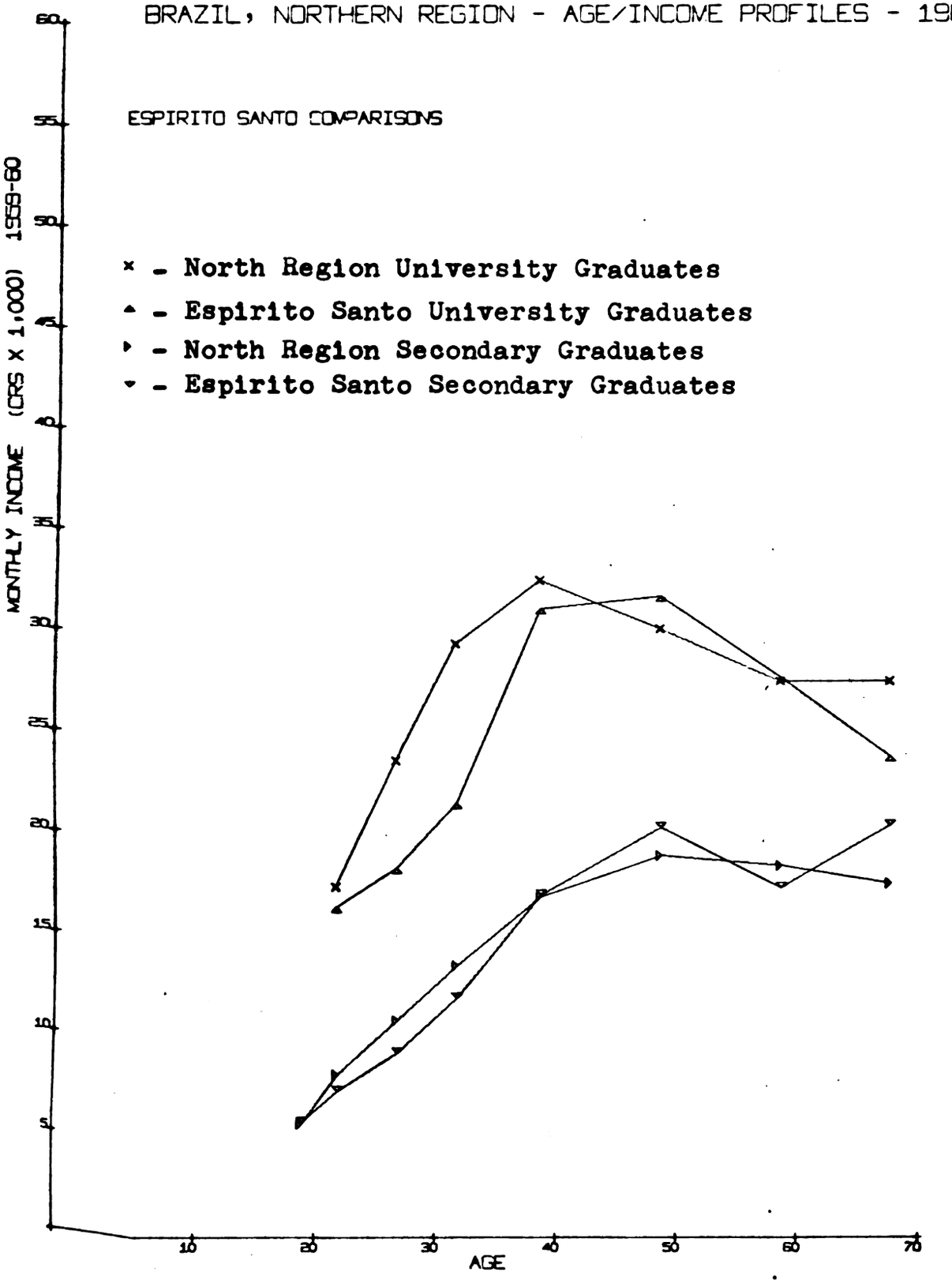


TABLE 40

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL SECONDARY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.
Years of University Completed													
z_1 - 1 year	52						intercept		16,635				
z_2 - 2 years	53					0.00709	0.11628	1.19533	18,686				
z_3 - 3 years	23					0.02806	0.27326	1.86579	21,862				
z_4 - 4 years	24					0.05747	0.49987	3.82840	28,829				
z_5 - 5 years	5					0.00257	0.13517	0.43163	19,042				
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	56	-0.16446	-1.10136	-11.09185	5,573	-0.16446	-1.09348	-11.04768	5,573				
z_8 - 22 " "	480	-0.28804	-0.73800	-16.02141	8,015	-0.28804	-0.74701	16.24743	7,881				
z_9 - 27 " "	513	-0.09012	-0.44469	-9.80673	10,748	-0.09012	-0.45553	-10.05937	10,548				
z_{10} 32 " "	381	0.05688	-0.22364	-4.57713	13,406	-0.05688	-0.22334	-4.58654	13,305				
z_{11} 39 " "	446	intercept			16,767	intercept			16,635				
z_{12} 49 " "	197	0.17641	0.11318	1.88885	18,776	0.17641	0.11452	1.91795	18,653				
z_{13} 59 " "	80	0.10309	0.08875	1.04365	18,323	0.10309	0.08862	1.04153	18,176				
z_{14} 68 " "	36	0.05932	0.03438	0.28335	17,353	0.05932	0.03467	0.28662	17.222				
Course Completed													
z_{15} Secondary	2189												
z_{16} Philosophy	0												
z_{17} Medicine	0												
z_{18} Pharmacy	0												
z_{19} Dentistry	0												
z_{20} Engineering	0												
z_{21} Law	0												
z_{22} Agronomy	0												
z_{23} Econ./Pol. Science	0												
z_{24} All other courses completed except Seminary	0												
Sex													
z_{25} Female	784												
z_{26} Male	1405												
Head of Family													
z_{27} Not Head	1103												
z_{28} Head	1084												

Religion				
x_{29}- Protestant	88			
x_{30}- Jewish	25			
x_{31}- Other	105			
x_{32}- Roman Catholic	1991			
Race				
x_{33}- Black	25			
x_{34}- White	1408			
x_{35}- Other	756			
Children				
x_{36}- Has Children	1084			
x_{37}- No Children	1105			
Class of Activity				
x_{38}- Agriculture	30			-0.02746 -0.19205 -1.41311 10,183
x_{39}- Extractive	62			0.13228 0.58458 5.98707 22,138
x_{40}- Mfg. Industry	158			0.08777 0.23337 3.44496 15,382
x_{41}- Commerce and Transportation	800			0.20031 0.19087 4.48235 14,938
x_{42}- Service Industries	53			-0.06148 -0.31335 -2.99302 9,889
x_{43}- Government or Other	444			intercept 12,139
x_{44}- Liberal Professions	167			-0.01540 -0.05385 -0.82373 11,692
x_{45}- Social Services	477			-0.30868 -0.46321 -9.75899 7,764
Position				
x_{46}- Public Employee	938			
x_{47}- Employer or Own Account	318			
x_{48}- Private Employee	932			
Migration				
x_{49}- No Migration	1510			
x_{50}- From Rural	76			
x_{51}- From Urban	597			
Environment				
x_{52}- Urban	1666			
x_{53}- Suburban	389			
x_{54}- Rural	128			
Analysis of Variance				
"F" Value		67.00718	44.69438	46.08602
R^2 ($\bar{R}^2$)		.17699 (.17474)	.18422 (.18048)	.12885 (.12647)
Std. Error of Estimate		0.70038	0.69793	0.72057

TABLE 40

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL SECONDARY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 4				Regression nº 5				Regression nº 6			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
							intercept		12,087		intercept		17,593
z_1 - 1 year	52					0.00709	0.04286	0.40030	12,616	0.00709	-0.00442	-0.05089	17,516
z_2 - 2 years	53					0.02806	0.21798	1.35048	15,030	0.02806	0.09115	0.71905	19,330
z_3 - 3 years	23					0.05747	0.42877	2.71289	18,557	0.05747	0.28992	2.24748	23,510
z_4 - 4 years	24					0.00257	0.04958	0.14384	12,701	0.00257	0.03356	0.12039	18,194
z_5 - 5 years	5												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	56	-0.16446	-0.99798	-10.52729	5,781					-0.16446	-0.59336	-6.41362	9,720
z_8 - 22 " "	480	-0.28804	-0.61870	-13.80018	8,447					-0.28804	-0.29726	-6.44682	13,069
z_9 - 27 " "	513	-0.09012	-0.37793	-8.66693	10,746					-0.09012	-0.15945	-3.63475	15,000
z_{10} - 32 " "	381	0.05688	-0.15262	-3.25300	13,462					0.05688	-0.02830	-0.63938	17,102
z_{11} - 39 " "	446		intercept		15,681						intercept		17,593
z_{12} - 49 " "	197	0.17641	0.10952	1.91158	17,496					0.17641	0.03369	0.62815	18,197
z_{13} - 59 " "	80	0.10309	0.10886	1.33726	17,485					0.10309	-0.01278	-0.16807	17,370
z_{14} - 68 " "	36	0.05932	0.02937	0.25358	16,149					0.05932	-0.16007	-1.47333	14,991
Course Completed													
z_{15} - Secondary	2189												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	784									-0.46030	-0.31499	-8.13184	12,839
z_{26} - Male	1405										intercept		17,593
Head of Family													
z_{27} - Not Head	1103									-0.47744	-0.21615	-6.30570	13,754
z_{28} - Head	1084										intercept		17,593

Religion									
x_{29} Protestant	68					0.02755	0.13457	1.42748	20,127
x_{30} Jewish	25						Intercept		17,993
x_{31} Other	165						Intercept		17,993
x_{32} Roman Catholic	1991					-0.04562	0.03476	0.60884	18,216
Race									
x_{33} Black	25					-0.01701	-0.06683	-0.53244	16,496
x_{34} White	1408						Intercept		17,993
x_{35} Other	756					-0.11933	-0.09276	-3.26998	16,085
Children									
x_{36} Has Children	1084					0.35676	0.10164	3.00279	19,476
x_{37} No Children	1105						Intercept		17,993
Class of Activity									
x_{38} Agriculture	30	-0.02746	-0.28130	-2.22486	11,836	-0.02746	-0.40410	-3.03686	11,785
x_{39} Extractive	62	0.13228	0.55537	6.13314	27,326	0.13228	0.32929	3.46946	24,454
x_{40} Mfg. Industry	154	0.08777	0.21391	3.42879	19,422	0.08777	0.08118	1.21096	19,081
x_{41} Commerce and Transportation	800	0.20031	0.17258	4.37083	18,695	0.20031	0.06008	1.14850	18,682
x_{42} Service Industries	53	-0.06148	-0.28839	-2.97270	11,753	-0.06148	-0.41789	-4.15954	11,584
x_{43} Government or Other	444		Intercept		15,681		Intercept		17,593
x_{44} Liberal Professions	167	-0.01540	-0.01942	-0.31973	15,380	-0.01540	-0.09679	-1.39475	15,970
x_{45} Social Services	477	-0.30868	-0.32931	-7.37643	11,281	-0.30868	-0.13273	-2.94034	15,406
Position									
x_{46} Public Employee	938						Intercept		17,593
x_{47} Employer or Own Account	318					0.25298	0.27936	4.92942	23,263
x_{48} Private Employee	932					0.02508	0.01242	0.27613	17,813
Migration									
x_{49} No Migration	1510					-0.16203	-0.11919	-3.82549	15,616
x_{50} From Rural	76					-0.00243	-0.13106	-1.72992	15,432
x_{51} From Urban	597						Intercept		17,593
Environment									
x_{52} Urban	1666						Intercept		17,593
x_{53} Suburban	389						Intercept		17,593
x_{54} Rural	128					0.01800	-0.15922	-2.50484	15,004
Analysis of Variance									
"F" Value		53.67516				2.30716			41.35600
R^2 ($\bar{R}^2$)		.25687 (.25244)				.00421 (.00285)			.36505 (.35653)
Std. Error of Estimate		0.66659				0.76987			0.61845

TABLE 40

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL SECONDARY GRADUATES (Cont.)

Variable Number and Description	Sample Size	Regression nº 7				Regression nº 8				Regression nº 9			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	52												
z_2 - 2 years	53												
z_3 - 3 years	23												
z_4 - 4 years	24												
z_5 - 5 years	5												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	56												
z_8 - 22 " "	480												
z_9 - 27 " "	513												
z_{10} - 32 " "	381												
z_{11} - 39 " "	446												
z_{12} - 49 " "	197												
z_{13} - 59 " "	80												
z_{14} - 68 " "	36												
Course Completed													
z_{15} - Secondary	2189												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	784												
z_{26} - Male	1405												
Head of Family													
z_{27} - Not Head	1103												
z_{28} - Head	1084												

Religion				
x_{29}- Protestant	68	-0.02755 0.01082 0.09384 13,729		
x_{30}- Jewish	25	intercept 13,572		
x_{31}- Other	105	intercept 13,572		
x_{32}- Roman Catholic	1991	-0.04562 -0.11887 -1.70460 12,051		
Race				
x_{33}- Black	25		-0.01701 -0.19211 -1.24403 10,786	
x_{34}- White	1408		intercept 13,071	
x_{35}- Other	756		-0.11933 -0.19676 -5.70143 10,736	
Children				
x_{36}- Has Children	1084			
x_{37}- No Children	1105			
Class of Activity				
x_{38}- Agriculture	30			
x_{39}- Extractive	62			
x_{40}- Mfg. Industry	154			
x_{41}- Commerce and Transportation .	800			
x_{42}- Service Industries	53			
x_{43}- Government or Other	444			
x_{44}- Liberal Professions	167			
x_{45}- Social Services	477			
Position				
x_{46}- Public Employee	938			
x_{47}- Employer or Own Account . . .	318			
x_{48}- Private Employee	932			
Migration				
x_{49}- No Migration	1510			-0.16203 -0.29785 -8.01851 11,220
x_{50}- From Rural	76			-0.00243 -0.22331 -2.41036 12,089
x_{51}- From Urban	597			intercept 15,113
Environment				
x_{52}- Urban	1666			intercept 15,113
x_{53}- Suburban	389			intercept 15,113
x_{54}- Rural	128			0.01800 -0.03631 -0.51692 14,578
Analysis of Variance				
"F" Value		2.28472	16.57623	21.67947
$R^2(\bar{R}^2)$		.00209 (.00165)	.01494 (.01450)	.02890 (.02802)
Std. Error of Estimate . . .		0.77034	0.76536	0.76009

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for those who finished three and four years without a degree. The low income of persons completing five years without a degree is not explained. There is no way of finding what courses these persons might have been taking which could indicate some reason for the low earnings. The following patterns are similar to those in Espírito Santo. Age variables alone explain more variance than is the case for All University Graduates. Class of Activity explains twice as much as with the university group. Some interdependence is found between the two classes ($\bar{R}^2$ = .301 alone versus $\bar{R}^2$ = .254 together). Other influences significant above the ninety percent level are as follows: women earn less than men, non-Heads of Family less than Heads of Family, Protestants more than Roman Catholics, non-whites less than Whites, those without children less than those with children, Private and Public Employees less than Self-Employed or Employers, those with no migration history less than those migrating from rural areas who in turn earn less than those who have migrated from urban areas. Rural environment is consistent with lower income than suburban or urban. Large income differences are also found within the Class of Activity variables. Extractive Industries show the best wages; Manufacturing, Commerce/Transportation, Government, and Liberal Professions show little significant differences; Social Services, Agriculture, and Service Industries are all significantly low compared with the upper and middle income activities.

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The age-income profile for this group as presented in Figure 33 shows the same higher early earnings pattern as exists for the university sample when both are compared to Espírito Santo. The fact that both university and secondary groups have this pattern tends to offset what would otherwise be a higher rate of return to North Region university graduates compared to those in Espírito Santo.

The separation of the university graduates into subsamples of Course Completed and Years Completed causes fewer problems of low significance than is the case for Espírito Santo. The cell sizes are generally bigger which potentially permits results of greater meaning.

Philosophy.--The three regressions for the sample of Philosophy graduates are presented in Table 41 and the age-income profile for the group is found in Figure 34. It is probable that a reporting error accounts for the one person who indicates a completed university course with only one year of training. In the regressions, this observation is included with the three-year graduates. At the ninety percent or greater level of significance non-Heads of Family earn less than Heads of Family, those without children less than those with children, and non-whites less than Whites. Significant between fifty and eighty percent are the following: Three Years Completed less than Four Years Completed, Males less than Females, Protestants less than Roman Catholics and less than the one Jew in the sample, and Employees less than Employers or Self-Employed. The cell sizes within

TABLE 41

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF PHILOSOPHY GRADUATES

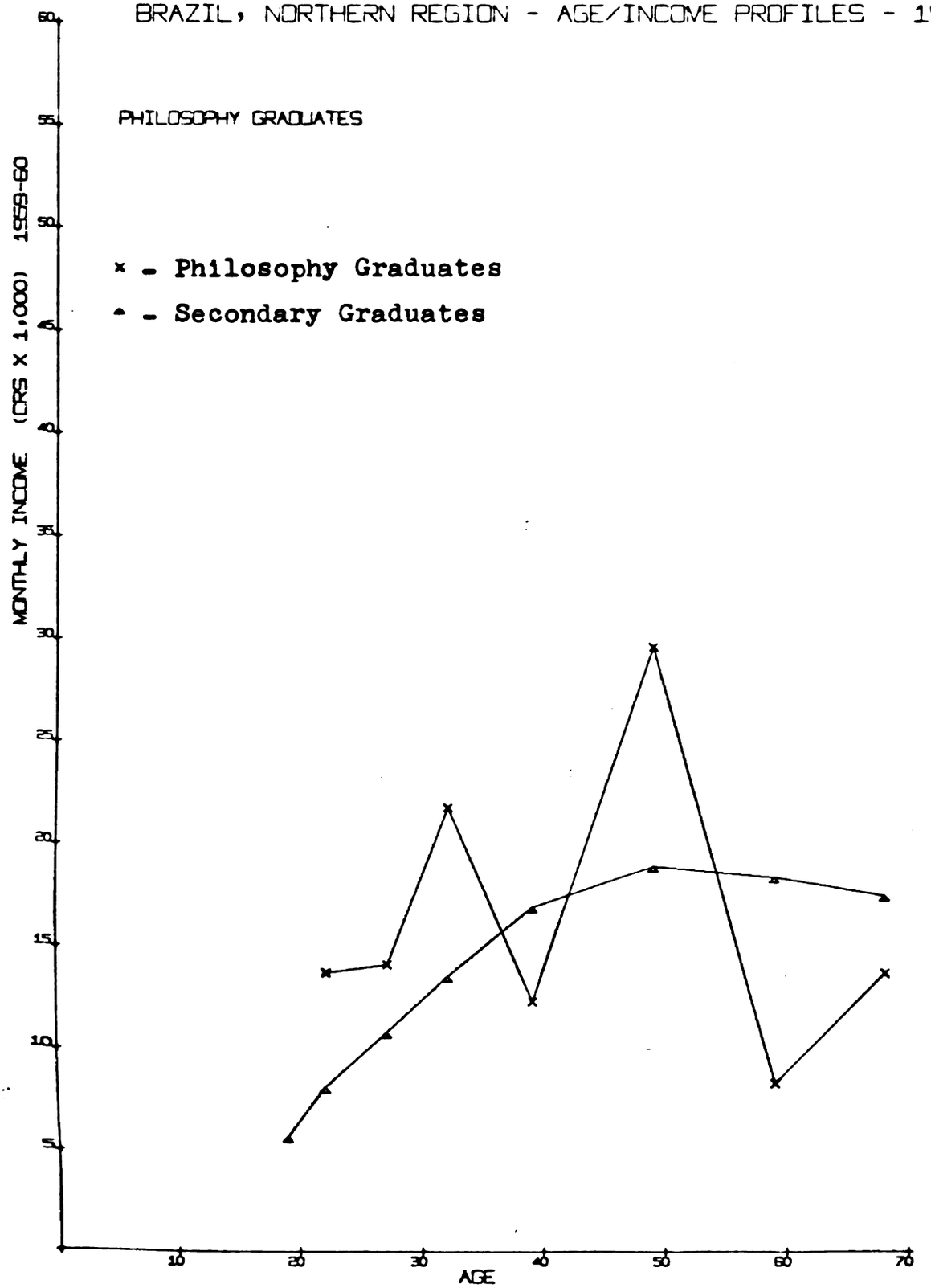
Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	1						intercept		8,910		intercept		14,945
z_2 - 2 years	0												
z_3 - 3 years	6						intercept		8,910		intercept		14,945
z_4 - 4 years	46					0.10777	0.38444	0.97328	13,087	0.10777	0.43745	1.13894	23,147
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	2	-0.01744	0.10301	0.14397	13,555	-0.01744	0.03517	0.04389	9,229	-0.01744	0.82535	1.02812	34,115
z_9 - 27 " "	15	-0.03294	0.13687	0.40367	14,022	-0.03294	0.12029	0.35411	10,049	-0.03294	0.70106	1.60870	30,128
z_{10} - 32 " "	8	-0.17230	0.57466	1.40032	21,724	0.17230	0.55487	1.34967	15,519	0.17230	0.57806	1.49583	26,641
z_{11} - 39 " "	17		intercept		12,228		intercept		8,910		intercept		14,945
z_{12} - 49 " "	5	0.23640	0.88211	1.81149	29,548	0.23640	0.89116	1.82868	21,722	0.23640	1.32639	2.40868	56,305
z_{13} - 59 " "	4	-0.17502	-0.39494	-0.74249	8,239	-0.17502	-0.46278	-0.86217	5,609	-0.17502	-1.06942	-1.25991	5,129
z_{14} - 68 " "	2	-0.01744	0.10301	0.14397	13,555	-0.01744	0.03517	0.04890	9,229	-0.01744	-0.57247	-0.78920	8,431
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	53												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	14										intercept		14,945
z_{26} - Male	39									0.19967	-0.44399	-1.07791	9,587
Head of Family													
z_{27} - Not Head	17									-0.34173	-1.26103	-3.10214	4,235
z_{28} - Head	36										intercept		14,945

Religion				
z_{29}- Protestant	14			0.20309 -0.41126 -0.87866 9,986
z_{30}- Jewish	1			0.12632 1.38594 1.54979 99,980
z_{31}- Other	6			0.28504 -0.10465 -0.17948 13,460
z_{32}- Roman Catholic	32			intercept 14,945
Race				
z_{33}- Black	0			intercept 14,945
z_{34}- White	45			-0.00342 -0.67809 -1.80887 7,586
z_{35}- Other	8			
Children				
z_{36}- Has Children	24			0.38269 1.28628 3.20546 58,091
z_{37}- No Children	29			intercept 14,945
Class of Activity				
z_{38}- Agriculture	1			0.00257 1.18427 0.99045 48,846
z_{39}- Extractive	3			-0.06693 -0.56762 -0.77908 8,472
z_{40}- Mfg. Industry	1			-0.15076 -0.27535 -0.31970 11,348
z_{41}- Commerce and Transportation .	7			0.18115 0.02949 0.06161 15,393
z_{42}- Service Industries	0			
z_{43}- Government or Other	2			0.09203 -0.32182 -0.43425 10,833
z_{44}- Liberal Professions	2			-0.04844 -0.63716 -0.69191 7,908
z_{45}- Social Services	37			intercept 14,945
Position				
z_{46}- Public Employee	12			0.14273 -0.60611 -0.95407 8,152
z_{47}- Employer or Own Account . . .	9			intercept 14,945
z_{48}- Private Employee	32			-0.23250 -0.34319 -0.75544 10,604
Migration				
z_{49}- No Migration	19			0.01728 0.16442 0.38507 17,616
z_{50}- From Rural	2			-0.04844 0.16788 0.20600 17,677
z_{51}- From Urban	31			intercept 14,945
Environment				
z_{52}- Urban	34			0.29566 0.07765 0.09068 16,152
z_{53}- Suburban	14			-0.26912 -0.42107 -0.48956 9,809
z_{54}- Rural	4			intercept 14,945
Analysis of Variance				
"F" Value		1.02477	1.01270	2.13188
$R^2(\bar{R}^2)$		.11790 (.02407)	.13609 (.02342)	.68069 (.38504)
Std. Error of Estimate . . .		0.95716	0.95771	0.76598

MONTHLY INCOME (CRS X 1,000) 1959-60

Fig. 34

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960



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Class of Activity are too small to be meaningful. Total lifetime earnings of Philosophy graduates are less than those of secondary graduates.

Medicine.--Table 42 and Figure 35 contain the results of the study for graduates of Medicine. In spite of a relatively large sample, the level of significance of the regression on all variables is only slightly better than seventy-five percent. Variables significant between fifty and eighty percent include Roman Catholics that earn less than other religions, those working in private practice earning less than those in government programs (not necessarily government employees), those who migrated from urban areas less than those from rural areas (an exception), and those living in suburban or rural environments less than those in urban areas.

The age-income profile shows the same general shape as that of graduates in Medicine in Espírito Santo, and interviews in both Pará and Amazonas produced the same statements concerning early retirement and income levels.

Pharmacy.--The regression on log income of all variables in the Pharmacy graduates sample is significant above the ninety percent level. The results are given in Table 43 and Figure 36. Individual variables with significance greater than ninety percent produce the following results: Six Years Completed earn more than Three Years Completed and government connected activities earn more than Manufacturing Industries, Commerce/Transportation, Liberal Professions, or Social

TABLE 42

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF MEDICINE GRADUATES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	1					-0.00947	0.00233	0.00346	43,452	-0.00947	0.16661	0.23903	29,877
z_6 - 6 years	146						intercept		43,351		intercept		25,292
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	1	-0.11790	-1.06129	-1.64769	15,000	-0.11790	-1.06129	-1.64184	15,000	-0.11790	-0.97214	-1.39740	9,567
z_9 - 27 " "	22	-0.19183	-0.43587	-2.62998	28,035	-0.19183	-0.43587	-2.62064	28,035	-0.19183	-0.37126	-1.73161	17,448
z_{10} - 32 " "	26	0.01599	-0.11766	-0.74974	38.538	0.01599	-0.11766	-0.74708	38,539	0.01599	-0.10955	-0.63676	22,661
z_{11} - 39 " "	45		intercept		43,351		intercept		43,351		intercept		25,292
z_{12} - 49 " "	41	0.05576	-0.08193	-0.59571	39.940	0.05576	-0.08193	-0.59360	39,940	0.05576	-0.08362	-0.57835	23,263
z_{13} - 59 " "	10	-0.03178	-0.21609	-0.97026	34.926	-0.03178	-0.21633	-0.92666	34,917	-0.03178	-0.28201	-1.08382	19,077
z_{14} - 68 " "	3	-0.07955	-0.49643	-1.30683	26.387	-0.07955	-0.49643	-1.30218	26,388	-0.07955	-0.45231	-1.14979	16,090
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	148												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	13									-0.09839	-0.03847	0.17497	26,289
z_{26} - Male	135										intercept		25,292
Head of Family													
z_{27} - Not Head	21									-0.15523	-0.13128	-0.67879	22,180
z_{28} - Head	127										intercept		25,292

Religion				
z_{29}- Protestant	2			-0.01343 0.32947 0.64297 35,162
z_{30}- Jewish	2			0.08188 0.66277 1.37147 49,071
z_{31}- Other	4			0.11660 0.52376 1.51454 42,702
z_{32}- Roman Catholic	140			intercept 25,292
Race				
z_{33}- Black	0			
z_{34}- White	114			-0.03830 -0.09366 -0.66970 23,081
z_{35}- Other	34			intercept 25,292
Children				
z_{36}- Has Children	109			0.16556 0.07389 0.46207 27,232
z_{37}- No Children	39			intercept 25,292
Class of Activity				
z_{38}- Agriculture	0			
z_{39}- Extractive	1			-0.00947 0.77597 0.76058 34,952
z_{40}- Mfg. Industry	0			
z_{41}- Commerce and Transportation	3			0.06158 -0.14631 -0.24391 21,849
z_{42}- Service Industries	0			intercept 25,292
z_{43}- Government or Other	17			0.08285 -0.32990 -0.72488 18,185
z_{44}- Liberal Professions	73			-0.08829 -0.10497 -0.51730 22,771
z_{45}- Social Services	54			
Position				
z_{46}- Public Employee	68			-0.11212 -0.04185 -0.13300 24,253
z_{47}- Employer or Own Account	72			0.12421 0.34524 0.92484 35,721
z_{48}- Private Employee	8			intercept 25,292
Migration				
z_{49}- No Migration	88			0.05166 0.01378 0.10991 25,843
z_{50}- From Rural	4			0.06182 0.43432 1.23870 39,049
z_{51}- From Urban	54			intercept 25,292
Environment				
z_{52}- Urban	138			0.18093 0.60683 0.83799 46,408
z_{53}- Suburban	8			-0.15469 -0.00378 0.00493 25,196
z_{54}- Rural	2			intercept 25,292
Analysis of Variance				
"F" Value		1.74401	1.48626	1.11098
$R^2(\bar{R}^2)$		.06908 (.03631)	.06908 (.02947)	.17815 (.02572)
Std. Error of Estimate		0.63706	0.63933	0.61088

MONTHLY INCOME (COP$ X 1.000) 1'(13.60

Fig. 35

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960

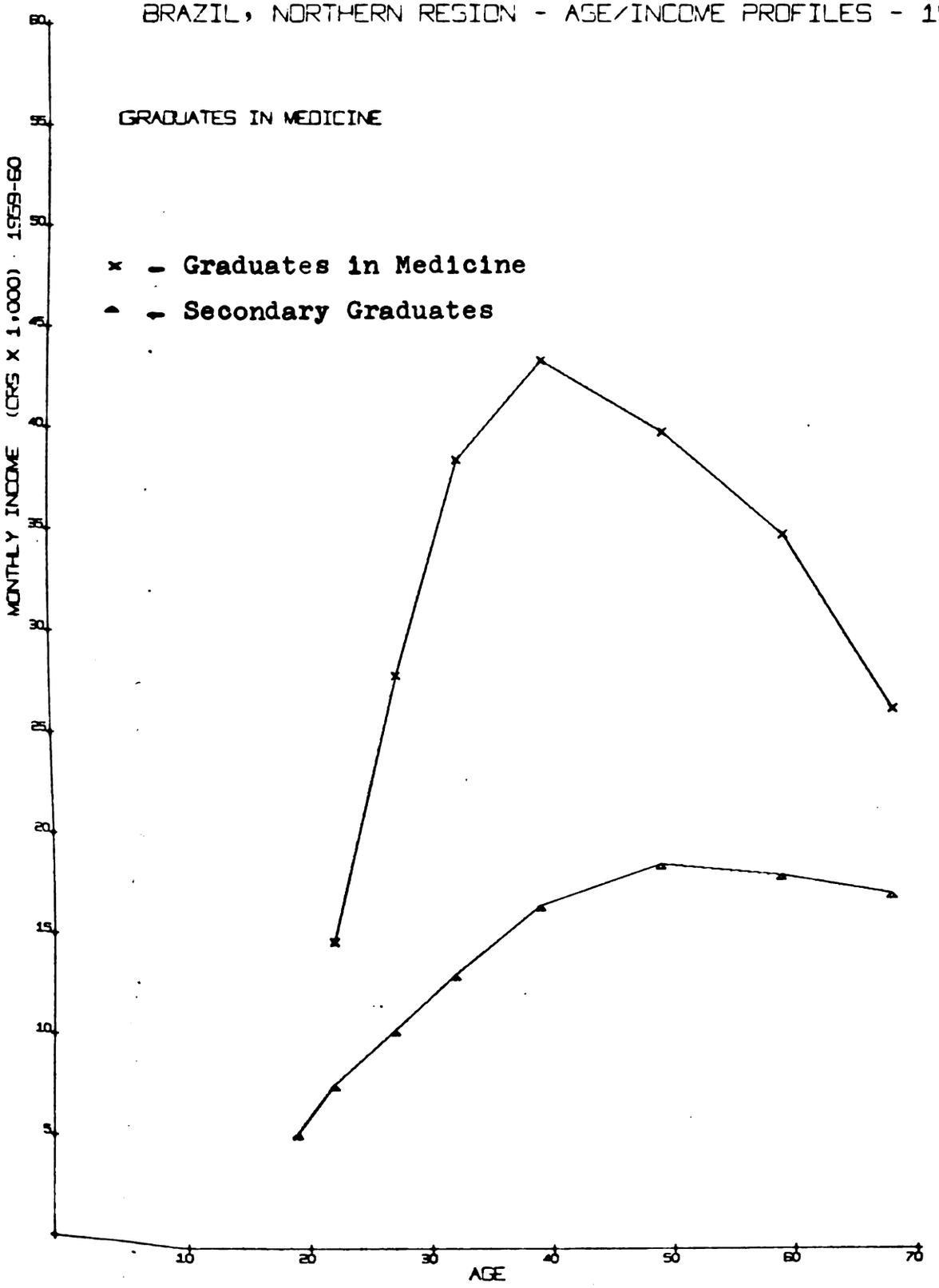


TABLE 49

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF PHARMACY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	14						intercept		15,492		intercept		25,920
z_4 - 4 years	21					0.01414	0.33178	1.41676	22,214	0.01414	0.45249	1.39218	40,752
z_5 - 5 years	0												
z_6 - 6 years	4					0.44751	1.21104	3.12345	53.517	0.44751	1.10035	1.77650	77,895
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	3	-0.22898	-0.94862	-1.93955	9.865	-0.22898	-0.81176	-1.78285	7,079	-0.22898	-0.22227	-0.33594	20,754
z_9 - 27 " "	6	-0.04775	-0.45666	-1.17043	16,134	-0.04775	-0.30044	-0.84823	11,805	-0.04775	0.40668	0.94713	38,927
z_{10} - 32 " "	5	-0.03520	-0.44208	-1.07339	16,371	-0.03520	-0.34835	-0.94038	11,253	-0.03520	-0.98104	-2.01315	9,718
z_{11} - 39 " "	8		intercept		25,473		intercept		15,942		intercept		25,920
z_{12} - 49 " "	9	-0.00836	-0.38681	-1.10190	17,301	-0.00836	-0.10248	-0.31255	14,389	-0.00836	-0.05796	-0.12275	24,460
z_{13} - 59 " "	6	-0.11741	-0.17692	-0.45346	21,342	0.11741	0.07053	0.19531	17,107	0.11741	-0.46167	-0.81018	16,336
z_{14} - 68 " "	2	-0.25188	-1.15816	-2.02780	8,000	-0.25188	-0.85540	-1.64340	6,777	-0.25188	-1.45644	-2.06075	6,041
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	39												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	10												
z_{26} - Male	29												
Head of Family													
z_{27} - Not Head	11									-0.34420	-0.04477	-0.07922	24,785
z_{28} - Head	28										intercept		25,920

Religion							
z_{29}- Protestant	5			-0.03520	-0.03972	-0.10406	24,910
z_{30}- Jewish	0						
z_{31}- Other	2			-0.01430	0.76128	1.14668	35,495
z_{32}- Roman Catholic	32				intercept		25,980
Race							
z_{33}- Black	0						
z_{34}- White	30				intercept		25,290
z_{35}- Other	9			-0.07882	0.62381	1.17252	48,368
Children							
z_{36}- Has Children	27			0.36692	-0.49046	1.07277	42,330
z_{37}- No Children	12				intercept		25,290
Class of Activity							
z_{38}- Agriculture	0						
z_{39}- Extractive	1			-0.03454	-1.47943	-1.35786	5,908
z_{40}- Mfg. Industry	2			-0.25188	-1.83831	-1.69933	4,123
z_{41}- Commerce and Transportation	24			0.01192	-2.21125	-2.63690	2,839
z_{42}- Service Industries	0						
z_{43}- Government or Other	3				intercept		25,290
z_{44}- Liberal Professions	2			-0.15069	-2.56380	-2.37899	1,996
z_{45}- Social Services	7			0.01926	-1.57618	-2.10218	5,399
Position							
z_{46}- Public Employee	10				intercept		25,290
z_{47}- Employer or Own Account	18			-0.04619	0.95844	1.35930	67,608
z_{48}- Private Employee	11			-0.31460	0.55601	0.92172	45,197
Migration							
z_{49}- No Migration	21			-0.27085	-0.20856	-0.68557	21,040
z_{50}- From Rural	0						
z_{51}- From Urban	18				intercept		25,290
Environment							
z_{52}- Urban	33			0.00630	0.60101	0.91604	47,277
z_{53}- Suburban	6				intercept		25,290
z_{54}- Rural	0						
Analysis of Variance							
"F" Value		1.16172	2.32583		1.67486		
$R^2(\bar{R}^2)$		.17886 (.05445)	.38279 (.24343)		.71973 (.33436)		
Std. Error of Estimate		0.72214	0.64687		0.61645		

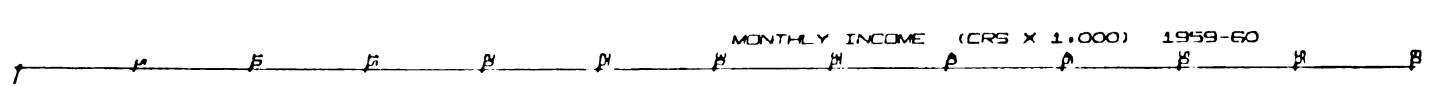
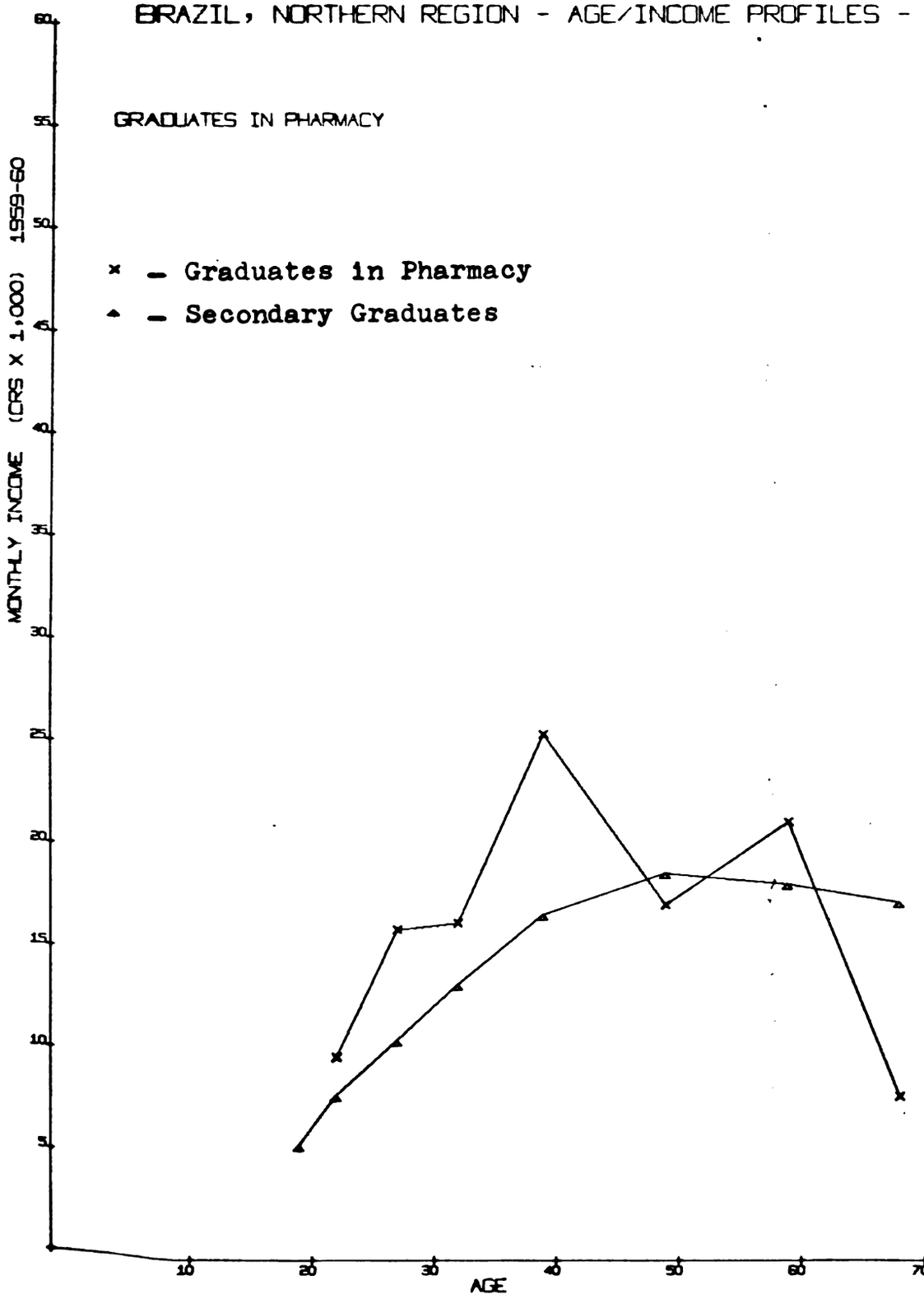

MONTHLY INCOME (CRS X 1,000) 1959-60

Fig. 36

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960



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Services. Between eighty and ninety percent, these variables are significant: Four Years Completed greater income than Three Years Completed, Extractive Industries less than Government, and Employer or Self-Employed greater than Public Employee. At the fifty to eighty percent significance level "Other Religions" (two observations) earn more than Roman Catholic or Protestants, non-whites earn more than Whites (an exception), those with children more than those without, Private Employees more than Public Employees, migration From Urban more than No Migration, and urban environment more than suburban.

Dentistry.--Table 44 and Figure 37 contain the results of the study for Dentistry graduates, the regression for which is significant at the ninety-eight percent level. Individual variables significant at the ninety percent level show greater income for those with children compared to those without and much less income for those in Social Services compared to those in all other Classes of Activity. The fifty to eighty percent level contains the following influences: Females earn more than Males, Heads of Family more than non-Heads of Family, Private Employees more than Public Employees, those migrating from urban areas more than those with no migration history, and urban/suburban dwellers more than rural.

The age-income profile for this group indicates another example of possible changes in educational quality. Interviews

TABLE 44

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF DENTISTRY GRADUATES

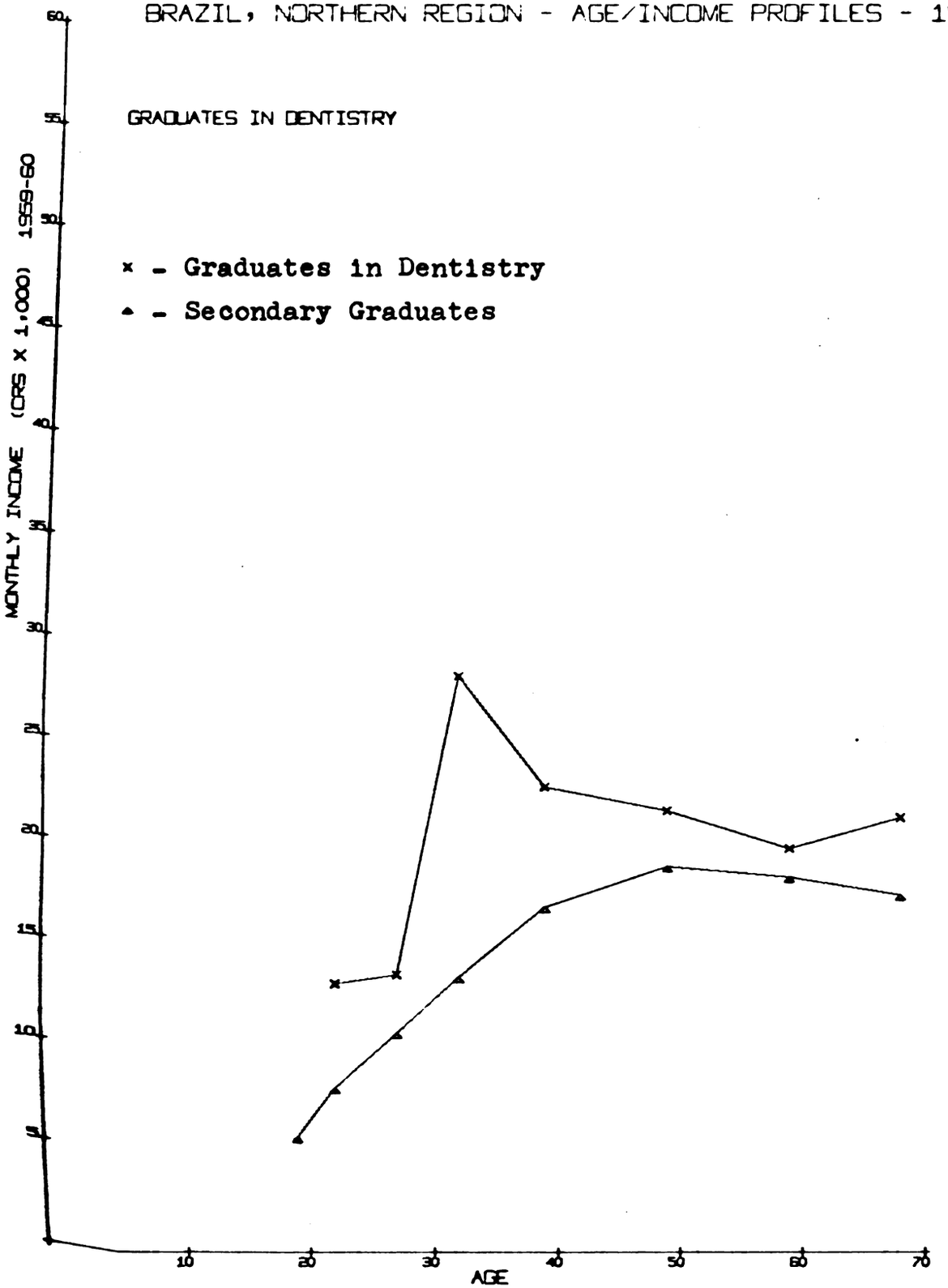
Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Ins.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	73						intercept		23,352			intercept	15,803
z_4 - 4 years	47					-0.08892	-0.11853	-1.10493	20,741	-0.08892	-0.07825	-0.65687	13,994
z_5 - 5 years	0												
z_6 - 6 years	1					0.07866	0.40466	0.71722	34,999	0.07866	0.16247	0.25797	17,803
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	3	-0.13208	-0.54937	-1.65019	13,084	-0.13208	-0.50025	-1.49251	14,160	-0.13208	-0.32565	-0.89219	10,927
z_9 - 27 " "	16	-0.30140	-0.51662	-3.12274	13,520	-0.30140	-0.50948	-3.06433	14,030	-0.30140	-0.20191	-0.94952	12,366
z_{10} - 32 " "	22	0.22717	0.21342	1.43510	28,056	0.22717	0.23740	1.58309	29,609	0.22717	0.21760	1.37941	18,812
z_{11} - 39 " "	38		intercept		22,664		intercept		23,352		intercept		15,133
z_{12} - 49 " "	27	0.01453	-0.05133	-0.36741	21,529	0.01453	-0.03294	-0.23412	22,595	0.01453	-0.07639	-0.49515	14,020
z_{13} - 59 " "	7	-0.03076	-0.13940	-0.61055	19,714	-0.03076	-0.08464	-0.36445	21,456	-0.03076	-0.11166	-0.47697	13,534
z_{14} - 68 " "	8	-0.00024	-0.06765	-0.31331	21,181	-0.00024	-0.08274	-0.37964	21,497	-0.00024	-0.14868	-0.66540	13,043
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	121												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Fol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	12									-0.12957	0.23584	1.15924	19,159
z_{26} - Male	109										intercept		15,133
Head of Family													
z_{27} - Not Head	24									-0.24841	-0.19916	-1.14064	12,400
z_{28} - Head	97										intercept		15,133

Religion							
z_{29}- Protestant	3			0.06005	-0.09824	-0.27943	13,719
z_{30}- Jewish	0						
z_{31}- Other	5			0.07804	0.18267	0.64688	18,167
z_{32}- Roman Catholic	113				Intercept		15,133
Race							
z_{33}- Black	0						
z_{34}- White	87				Intercept		15,133
z_{35}- Other	34			0.06481	0.01633	0.13533	15,388
Children							
z_{36}- Has Children	93			0.29521	0.28553	1.86278	20,135
z_{37}- No Children	28				Intercept		15,133
Class of Activity							
z_{38}- Agriculture	1			-0.05419	-0.52781	-0.81091	8,987
z_{39}- Extractive	0						
z_{40}- Mfg. Industry	1			0.07866	0.47134	0.81560	24,286
z_{41}- Commerce and Transportation .	8			0.13248	0.01333	0.04334	15,336
z_{42}- Service Industries	1			-0.15276	-1.41354	-2.07160	3,682
z_{43}- Government or Other	18				Intercept		15,133
z_{44}- Liberal Professions	76			0.06342	-0.10011	-0.33078	13,692
z_{45}- Social Services	16			-0.20424	-0.49533	-2.32607	9,222
Position							
z_{46}- Public Employee	37				Intercept		15,133
z_{47}- Employer or Own Account . . .	78			-0.02488	0.03374	0.12782	15,653
z_{48}- Private Employee	6			0.21008	0.46813	1.48256	24,169
Migration							
z_{49}- No Migration	68			-0.13751	-0.11812	-0.99102	13,447
z_{50}- From Rural	6			0.04492	0.10247	0.33688	16,766
z_{51}- From Urban	47				Intercept		15,133
Environment							
z_{52}- Urban	103			0.00283	0.35431	1.36829	21,568
z_{53}- Suburban	12			0.00423	0.35964	1.11976	21,683
z_{54}- Rural	6				Intercept		15,133
Analysis of Variance							
"F" Value		3.17824		2.61171			1.71525
R^2 ($\bar{R}^2$)		.14330 (.10606)		.15722 (.10502)			.32176 (.14329)
Std. Error of Estimate . . .		0.55512		0.55549			0.54394

MONTHLY INCOME (CFS x 1,000) 1959-60

Fig. 37

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960



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with the head of the Dental Association in the State of Pará and a Professor of Dentistry at the Universidade Federal do Amazonas give support to this view. Since World War II the profession of Dentistry has risen from a dominantly "practical" occupation to one requiring increasing amounts of university training. As in Espírito Santo, the opinions expressed indicate that the expected age-income profiles of the younger members of the profession will approach those of the medical profession.

Engineering.--Many more factors are significant in explaining the income variance of the Engineering graduates than is the case in Espírito Santo. The variance itself is also considerably greater as shown by the regressions in Table 45. At the ninety percent significance level, Heads of Family earn more than non-Heads of Family, and those working in Extractive and Manufacturing Industries earn more than those working in other Classes of Activity. The fifty to ninety percent range includes the following influences: Females (two) earn more than Males, Jews and "Other Religions" earn more than Roman Catholics and Protestants, Whites more than non-whites, those with children less than those without children (an exception), Liberal Professions more than Government, and migration From Urban more than No Migration or migration From Rural.

The age-income profile in Figure 38 shows the same general lifetime earnings pattern as is the case for Engineering graduates in Espírito Santo.

TABLE 45

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ENGINEERING GRADUATES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	170												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	9	-0.23457	-0.81359	-3.21293	17,727	-0.23457	-0.68995	-2.40068	18,622				
x_9 - 27 " "	27	-0.13968	-0.32930	-1.98292	28,770	-0.13968	-0.22393	-1.26974	29,677				
x_{10} - 32 " "	43	0.08352	0.00671	0.04655	40,460	0.08352	-0.08826	-0.61743	33,989				
x_{11} - 39 " "	53		intercept		39,991		intercept		37,126				
x_{12} - 49 " "	18	0.03729	-0.01875	-0.09787	39,218	0.03729	-0.16781	-0.88281	31,390				
x_{13} - 59 " "	10	0.08114	0.13738	0.56733	45,881	0.08114	0.10179	0.41117	41,104				
x_{14} - 68 " "	11	-0.02115	-0.15512	-0.66669	34,215	-0.02115	-0.06112	-0.25619	34,914				
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	171												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Fin. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	2					-0.00548	0.76134	1.04486	65,083				
x_{26} - Male	169						intercept		37,126				
Head of Family													
x_{27} - Not Head	34					-0.29219	-0.82163	-2.18054	24,280				
x_{28} - Head	137						intercept		37,126				

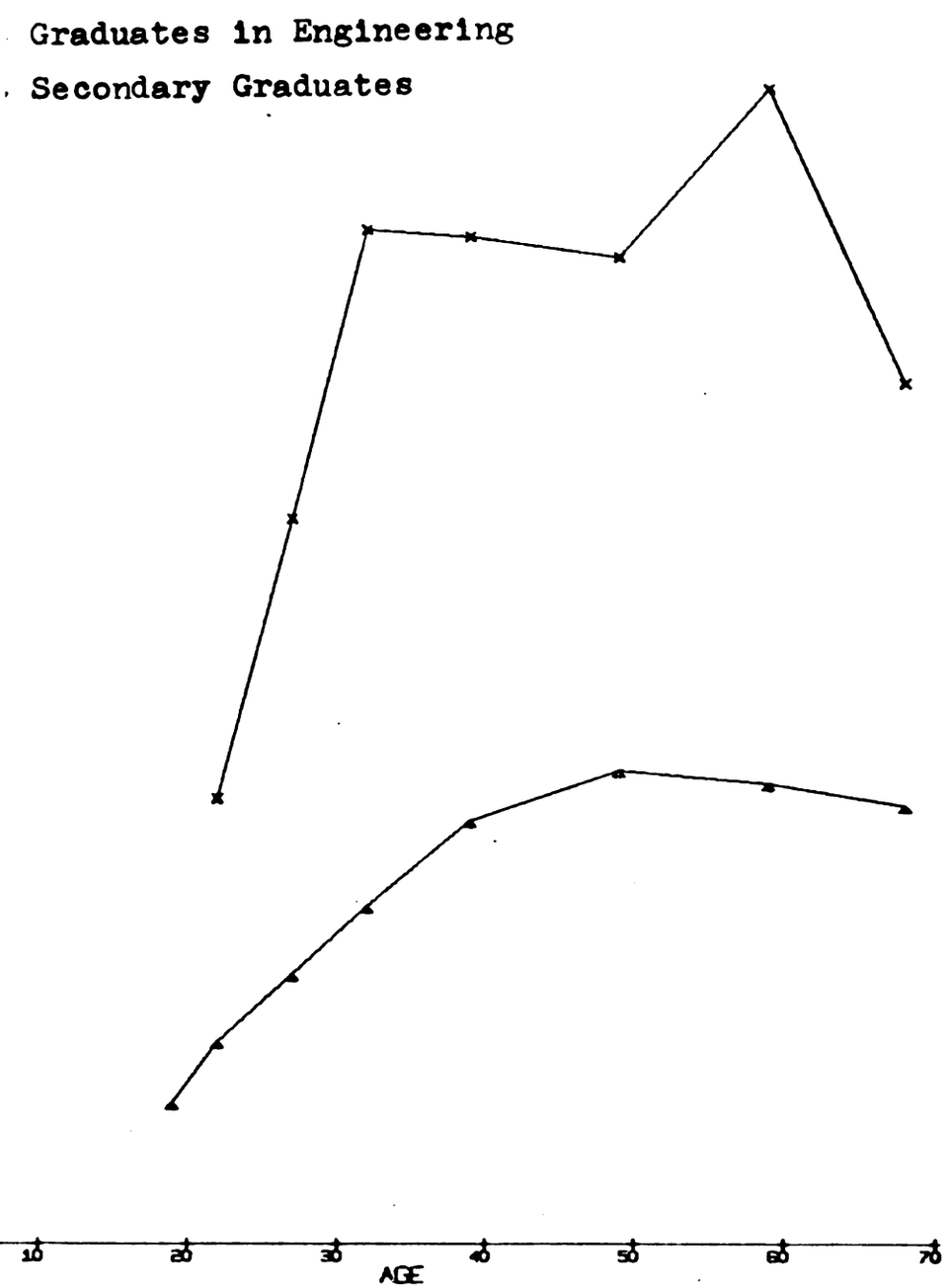
Religion				
x_{29}- Protestant	13		0.07471 -0.10910 -0.49307	33,288
x_{30}- Jewish	3		0.12316 0.55994 1.39926	48,991
x_{31}- Other	12		0.02530 0.21623 0.92966	46,088
x_{32}- Roman Catholic	143		intercept	37,126
Race				
x_{33}- Black	0			
x_{34}- White	136		intercept	37,126
x_{35}- Other	35		-0.15439 -0.19071 -1.41946	30,879
Children				
x_{36}- Has Children	115		0.07739 -0.18765 -1.48786	30,773
x_{37}- No Children	56		intercept	37,126
Class of Activity				
x_{38}- Agriculture	1		-0.09412 -0.43437 -0.50609	24,045
x_{39}- Extractive	23		0.21458 0.70165 2.59209	74,885
x_{40}- Mfg. Industry	39		0.17510 0.44407 2.17346	57,881
x_{41}- Commerce and Transportation	17		-0.13781 -0.06751 -0.25165	34,702
x_{42}- Service Industries	2		-0.00548 0.14544 0.27248	42,938
x_{43}- Government or Other	29		intercept	37,126
x_{44}- Liberal Professions	55		-0.07676 0.30033 1.14946	50,131
x_{45}- Social Services	5		0.00101 0.22624 0.65914	46,551
Position				
x_{46}- Public Employee	52		intercept	37,126
x_{47}- Employer or Own Account	50		-0.09063 -0.05585 -0.23819	35,109
x_{48}- Private Employee	69		0.17242 0.06637 0.34029	39,673
Migration				
x_{49}- No Migration	97		-0.06397 0.09590 0.80048	40,862
x_{50}- From Rural	6		-0.12181 -0.38015 -1.12285	25,385
x_{51}- From Urban	68		intercept	37,126
Environment				
x_{52}- Urban	135		-0.08578 -0.03901 -0.22417	35,705
x_{53}- Suburban	12		0.03241 0.01707 0.06561	37,765
x_{54}- Rural	23		intercept	37,126
Analysis of Variance				
"F" Value		2.61371	2.14823	
R^2 ($\bar{R}^2$)		.08727 (.05962)	.27947 (.15525)	
Std. Error of Estimate		0.70237	0.66598	

MONTHLY INCOME (CPS x 1,000) 1959-60

Fig. 38

RAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960

DUATES IN ENGINEERING



Law.--Table 46 contains the regressions for the sample of Law graduates. The influence of variables significant at the ninety percent level produce the following results: Females earn less than Males, non-Heads of Family less than Heads of Family, and rural/suburban residents less than urban. At the fifty to ninety percent level, Roman Catholics earn more than all other religious groups, those without children more than those with children, those in Agriculture and Liberal Professions more than in Government or Manufacturing. The Employer or Own Account variable represents higher income than does the Public Employee group, and those having migrated from an urban area earn more than those with no migration history.

The age-income profile in Figure 39 shows a similar pattern to that of the Law graduates in Espírito Santo with earnings generally increasing throughout the life span. An exception is found in the Age 59 group whose earnings are lower than those of the overall pattern.

Agronomy.--The same phenomenon of relatively high earnings in the younger age groups of Agronomists exists as in the State of Espírito Santo. Interviews in Pará support the view that this probably represents differences in the quality of the Agronomy curriculum completed by younger graduates compared to their older colleagues. The regressions for this group are contained in Table 47 and their age-income profile in Figure 40. The overall significance of the regression of all variables is over seventy-five percent. Two individual

TABLE 46

BRAZIL, SOUTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF LAW GRADUATES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"t" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	253												
x_6 - 6 years	1												
							Intercept		35,320		Intercept		16,564
						0.10691	1.0068	1.53589	99,996	0.10691	1.06626	1.51353	48,111
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	3	-0.11048	-0.86928	-2.19966	14,999	-0.11048	-0.85643	-2.16272	14,999	-0.11048	-0.69596	-1.73950	8,259
x_9 - 27 " "	31	-0.16440	-0.46598	-3.26769	22,450	-0.16440	-0.47313	-3.18079	22,450	-0.16440	-0.29866	-1.93774	12,287
x_{10} - 32 " "	62	-0.18276	-0.38157	-3.31889	24,428	-0.18276	-0.36872	-3.23622	24,428	-0.18276	-0.31617	-2.75141	12,074
		Intercept			35,777	Intercept			35,320	Intercept			16,564
x_{11} - 39 " "	87	0.11775	0.02134	0.17240	16,769	0.11775	0.03119	0.27630	36,769	0.11775	0.04086	0.33513	17,255
x_{12} - 49 " "	20	-0.01183	-0.18236	-1.08166	29,813	-0.01183	-0.16951	-1.00696	29,813	-0.01183	-0.09633	-0.56271	15,043
x_{13} - 59 " "	11	0.15981	0.37817	1.74298	52,220	0.15981	0.39102	1.80578	52,220	0.15981	0.37018	1.71662	23,985
x_{14} - 68 " "													
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	255												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	16									-0.21868	-0.49043	-2.55976	10,103
x_{26} - Male	239										Intercept		16,564
Head of Family													
x_{27} - Not Head	46									-0.24308	-0.25382	-1.80381	12,851
x_{28} - Head	208										Intercept		16,564

Religion				
z_{29}- Protestant	3			-0.02347 -0.16960 -0.43453 13,988
z_{30}- Jewish	3			0.03076 -0.10820 -0.26490 14,980
z_{31}- Other	21			-0.03419 -0.21076 -1.37403 13,336
z_{32}- Roman Catholic	288			intercept 16,564
Race				
z_{33}- Black	0			
z_{34}- White	291			intercept 16,564
z_{35}- Other	21			0.00403 0.03153 0.31339 17,095
Children				
z_{36}- Has Children	186			0.12263 -0.11737 -1.03541 14,730
z_{37}- No Children	69			intercept 16,564
Class of Activity				
z_{38}- Agriculture	2			0.08261 0.45320 0.97018 26,042
z_{39}- Extractive	2			-0.09003 0.15723 0.30425 19,385
z_{40}- Mfg. Industry	6			-0.11816 -0.25366 -0.78676 12,853
z_{41}- Commerce and Transportation	31			-0.03517 -0.07419 -0.41658 15,380
z_{42}- Service Industries	0			
z_{43}- Government or Other	108			intercept 16,564
z_{44}- Liberal Professions	84			0.16615 0.13113 0.67826 18,885
z_{45}- Social Services	22			-0.06437 0.01696 0.10513 16,847
Position				
z_{46}- Public Employee	126			intercept 16,564
z_{47}- Employer or Own Account	93			0.10285 0.14815 0.77185 19,210
z_{48}- Private Employee	36			-0.04314 0.08271 0.48605 17,993
Migration				
z_{49}- No Migration	168			-0.12716 -0.14990 -1.58572 14,259
z_{50}- From Rural	7			-0.04507 -0.02631 -0.10876 17,095
z_{51}- From Urban	79			intercept 16,564
Environment				
z_{52}- Urban	235			-0.18145 0.93453 3.15601 42,173
z_{53}- Suburban	13			-0.05857 0.58426 1.72838 29,711
z_{54}- Rural	7			intercept 16,564
Analysis of Variance				
"F" Value		5.21311	4.82986	3.15133
R^2 ($\bar{R}^2$)		.11200 (.09417)	.12040 (.09913)	.26436 (.18406)
Std. Error of Estimate		0.67522	0.67337	0.64095

Fig. 39

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960

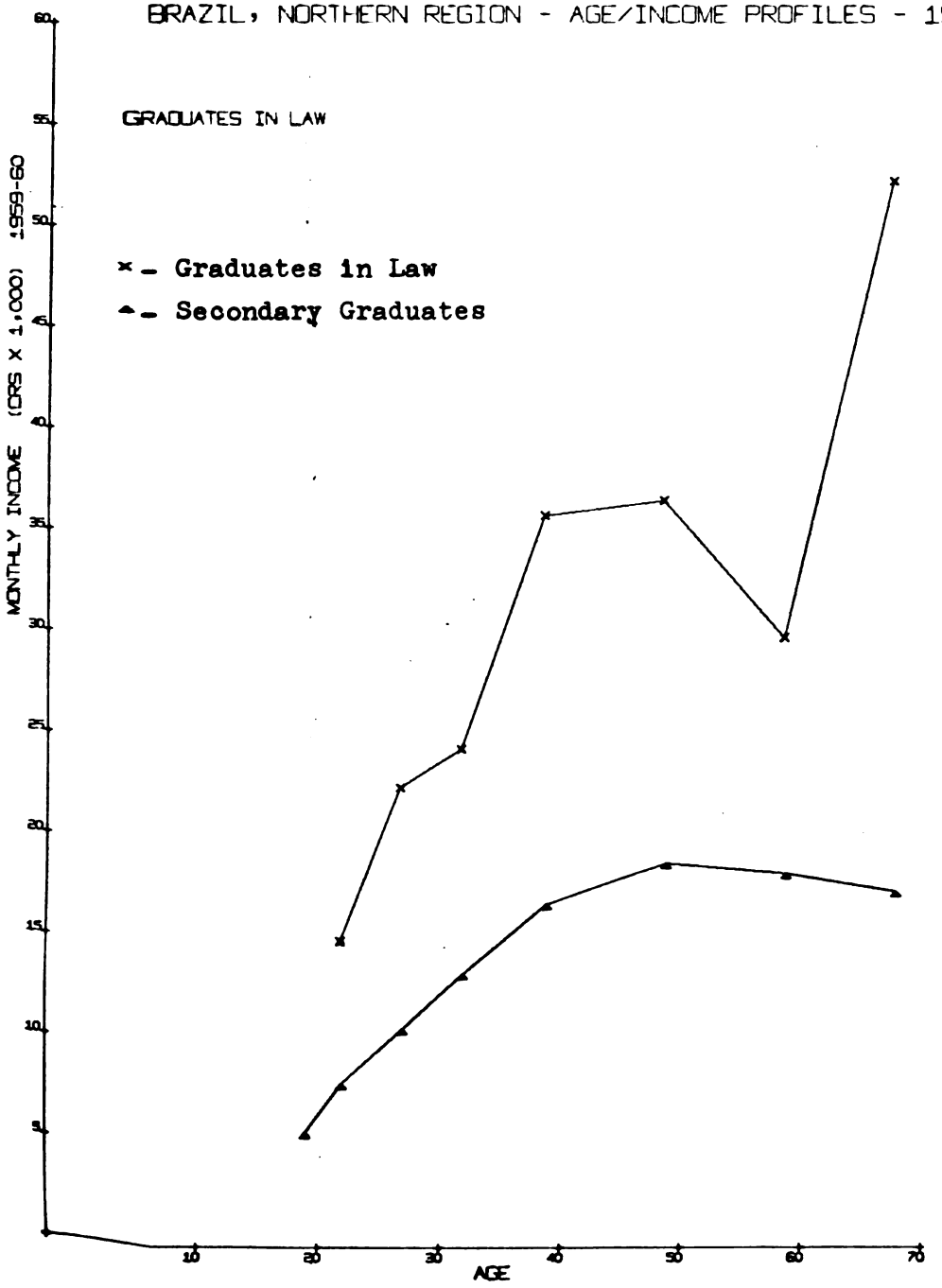


TABLE 47

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF AGRONOMY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	79												
x_5 - 5 years	0												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	2	-0.16498	-1.19490	-1.90064	8,874	-0.16498	-0.07490	-0.09024	18,933				
x_9 - 27 " "	7	-0.15815	-0.75748	-2.01613	13,743	-0.15815	-0.25893	-0.62074	15,750				
x_{10} - 32 " "	10	-0.09602	-0.54152	-1.62782	17,056	-0.09602	-0.71746	-1.72375	9,958				
x_{11} - 39 " "	18	intercept			29,313	intercept			20,406				
x_{12} - 49 " "	27	-0.01166	-0.14162	-1.33104	20,830	-0.01166	-0.19847	-0.71532	16,732				
x_{13} - 59 " "	8	0.06961	-0.15227	-0.42485	25,172	0.06961	0.28443	0.66450	27,119				
x_{14} - 68 " "	7	-0.00315	-0.33649	-0.89561	20,937	-0.00315	0.17095	0.40766	24,210				
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	79												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	1					-0.04573	-0.97854	-0.92650	7,670				
x_{26} - Male	78					intercept			20,486				
Head of Family													
x_{27} - Not Head	9												
x_{28} - Head	70												

Religion					
z_{29}- Protestant	8		0.00756	-0.12799	-0.34279 17,961
z_{30}- Jewish	0				
z_{31}- Other	13				
z_{32}- Roman Catholic	58		-0.09945	-0.22820	-0.73835 16,242
			intercept		20,406
Race					
z_{33}- Black	0				
z_{34}- White	39		intercept		20,406
z_{35}- Other	40		-0.31333	-0.68375	-2.85000 18,299
Children					
z_{36}- Has Children	64		-0.11299	0.51017	1.47025 33,987
z_{37}- No Children	15		intercept		20,406
Class of Activity					
z_{38}- Agriculture	19		0.00094	0.36589	0.85688 29,421
z_{39}- Extractive	5		0.12890	0.45717	0.93405 32,233
z_{40}- Mfg. Industry	1		0.20790	2.25530	2.20642 198,633
z_{41}- Commerce and Transportation .	14		0.06974	0.21818	0.51530 25,381
z_{42}- Service Industries	1		-0.12977	-1.12512	-1.00835 6,624
z_{43}- Government or Other	30		intercept		20,406
z_{44}- Liberal Professions	4		0.09381	0.78687	1.27480 44,821
z_{45}- Social Services	5		0.03955	0.24170	0.56027 26,590
Position					
z_{46}- Public Employee	36		intercept		20,406
z_{47}- Employer or Own Account . . .	23		-0.03027	-0.10549	-0.23044 18,363
z_{48}- Private Employee	20		0.15831	0.12685	0.34935 23,166
Migration					
z_{49}- No Migration	35		0.01017	0.14450	-0.52624 17,660
z_{50}- From Rural	3		0.13435	0.44992	0.83299 32,000
z_{51}- From Urban	41		intercept		20,406
Environment					
z_{52}- Urban	45		0.10869	-0.04290	-0.14422 19,529
z_{53}- Suburban	10		-0.13763	-0.24238	-0.65378 16,013
z_{54}- Rural	23		intercept		20,406
Analysis of Variance					
"F" Value		1.27423	1.26715		
R^2 ($\bar{R}^2$)		.09599 (.03408)	.37435 (.09600)		
Std. Error of Estimate . . .		0.84346	0.81797		

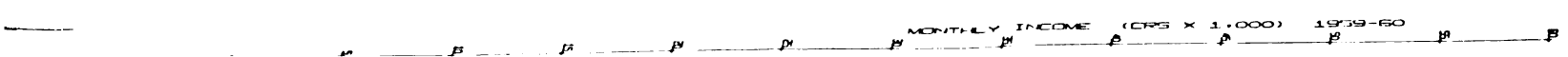
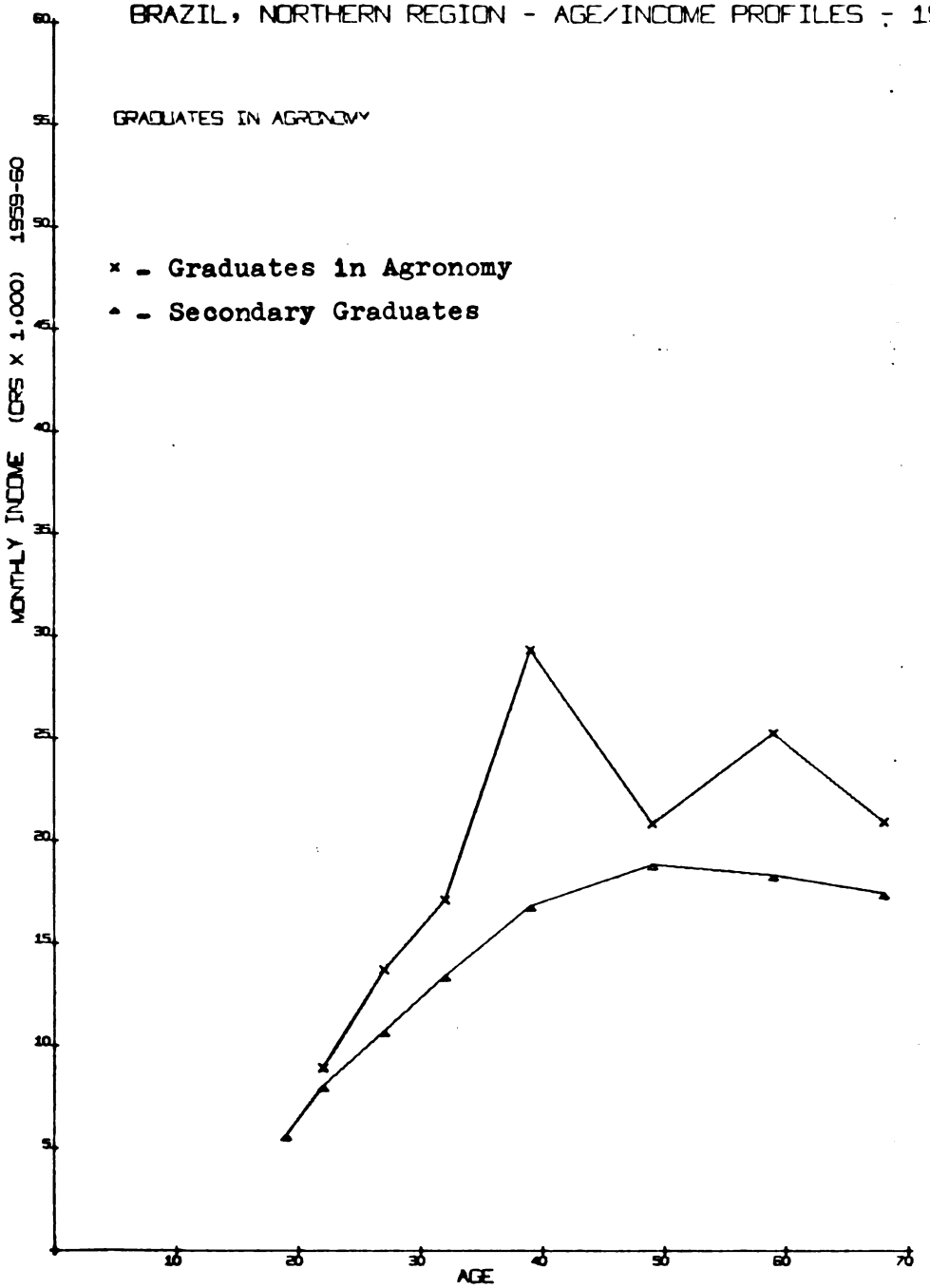

MONTHLY INCOME (CRS X 1,000) 1959-60

Fig. 40

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960



variables are significant above the ninety-five percent level--non-whites earn less than Whites, and the one agronomist employed in Manufacturing Industry earns more than those in the other Classes of Activity. At the fifty to eighty percent significance level, the one woman graduate earns less than her male colleagues; Roman Catholics earn more than "Other Religions"; those with children more than those without; and those in Agriculture, Extractive Industry, and Liberal Professions more than those in Government projects. Migrants from rural areas earn more than persons with no migration history or migrants from urban areas.

Economic and Political Sciences.--The regressions and age-income profile for this group are contained in Table 48 and Figure 41. Heads of Family earn more than non-Heads of Family, Roman Catholics earn more than "Other Religions," and the two persons in Extractive Industry earn more than those in Government or Commerce/Transportation at the ninety percent significance level or above. Between levels of fifty to ninety percent, non-whites earn more than Whites (an exception); persons in Manufacturing Industries, Commerce/Transportation, Liberal Professions, and Social Services earn more than those in Government. Persons in the private sector have greater incomes than those who are Public Employees. Migrants from urban areas earn more than individuals without migration histories or those who had migrated from rural areas. Both urban and suburban residents' incomes exceed the income of the one rural inhabitant.

TABLE 48

BRAZIL, NORTH REGION

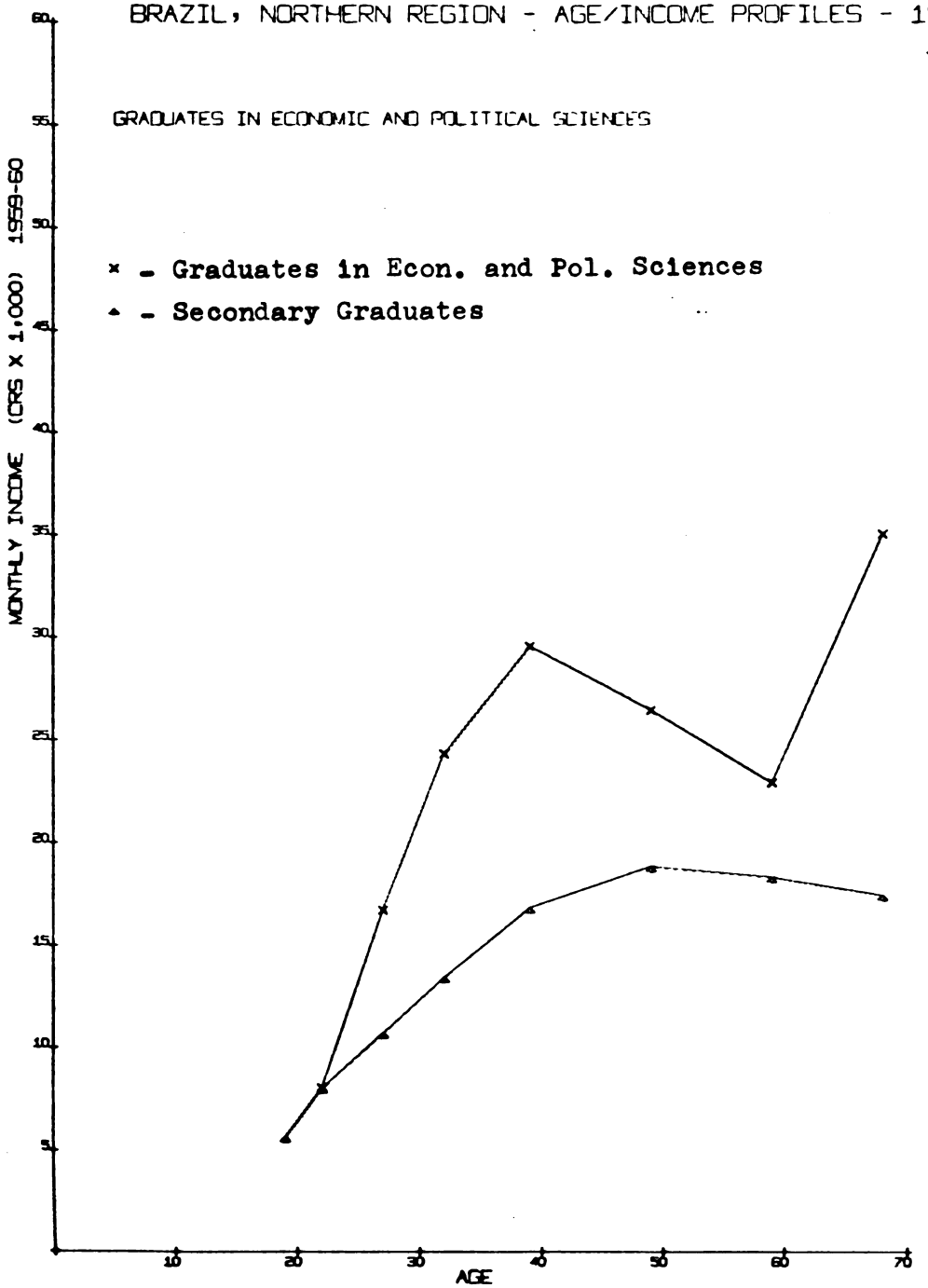
REGRESSIONS OF LOG INCOME FROM SAMPLE OF ECONOMIC AND POLITICAL SCIENCES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	29												
x_5 - 5 years	0												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	2	-0.50994	-1.30644	-3.07895	8,000	-0.50994	-1.03809	-1.68582	32,900				
x_9 - 27 " "	4	-0.21694	-0.56849	-1.67101	16,733	-0.21694	-0.61220	-1.18497	50,369				
x_{10} - 32 " "	7	0.07548	-0.19366	-0.65217	24,342	0.07548	0.21250	0.67715	114,903				
x_{11} - 39 " "	5		intercept		29,544		intercept		92,905				
x_{12} - 49 " "	6	0.14270	-0.11297	-0.36787	26,388	0.14270	0.06565	0.21809	99,210				
x_{13} - 59 " "	4	0.00985	-0.25418	-0.74715	22,913	0.00985	-0.16330	-0.48728	78,907				
x_{14} - 68 " "	1	0.14909	0.16946	0.30502	35,000	0.14909	1.50585	2.04972	418,816				
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	29												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	3												
x_{26} - Male	26												
Head of Family													
x_{27} - Not Head	9					-0.49246	-1.20850	-2.74384	27,746				
x_{28} - Head	20						intercept		92,905				

Religion						
x_{29}- Protestant	0					
x_{30}- Jewish	0					
x_{31}- Other	4		0.00985	-1.25393	-2.95405	26,460
x_{32}- Roman Catholic	25			intercept		92,905
Race						
x_{33}- Black	0					
x_{34}- White	17			intercept		92,905
x_{35}- Other	12		-0.21748	0.21890	0.84862	115,641
Children						
x_{36}- Has Children	20			intercept		92,905
x_{37}- No Children	9		-0.49246	0.34113	0.62315	130,875
Class of Activity						
x_{38}- Agriculture	0					
x_{39}- Extractive	2		0.21471	1.87960	2.15000	608,611
x_{40}- Mfg. Industry	1		0.14909	0.65270	0.80184	178,802
x_{41}- Commerce a... Transportation	18		0.00701	0.63007	1.01805	174,452
x_{42}- Service Industries	1		-0.13977	-0.17133	-0.22564	78,041
x_{43}- G.-rnment or Other	2			intercept		92,905
x_{44}- Liberal Professions	4		-0.10354	0.82888	0.88625	212,823
x_{45}- Social Services	1		-0.13977	0.50329	0.54261	153,680
Position						
x_{46}- Public Employee	4			intercept		92,905
x_{47}- Employer or Own Account	11		0.10161	-0.54445	-1.11086	53,899
x_{48}- Private Employee	14		-0.02722	-0.64299	-1.54652	48,842
Migration						
x_{49}- No Migration	18		-0.18221	0.23716	0.82018	117,771
x_{50}- From Rural	1		-0.13977	-0.57545	-1.14524	52,254
x_{51}- ...om Urban	10			intercept		92,905
Environment						
x_{52}- Urban	24		0.02250	-1.29076	-1.67569	25,554
x_{53}- Suburban	4		-0.10354	-1.53069	-1.85537	20,103
x_{54}- Rural	1			intercept		92,905
Analysis of Variance						
"F" Value		2.10731		2.75832		
$R^2(\bar{R}^2)$		.36500 (.22695)		.91002 (.64008)		
Std. Error of Estimate		0.50715		0.36554		

Fig. 41

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960



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All Other Courses Completed.--Table 49 and Figure 42 contain the results for this sub-sample. The same anomaly concerning Years Completed exists in this group as in the comparable Espírito Santo sample. Each additional year of university completed is consistent with lower incomes at levels of significance between eighty and ninety percent. Among the other variables, Males earn less than Females and persons in Agriculture and Service Industries earn less than those in other Classes of Activity with levels of significance greater than ninety percent. Influences with significance levels between fifty and eighty percent are as follows: Heads of Family earn more than non-Heads of Family, Roman Catholics earn more than individuals with "Other Religions" but less than Protestants. The one Black earns more than Whites who, in turn, earn more than mulattoes. Persons in Liberal Professions earn more than those in Government, who earn more than those in Social Services. Urban environment incomes exceed non-urban and incomes of those with No Migration exceed urban migrants whose incomes exceed migrants from rural areas.

Studies by Years of University Completed.--Tables 50 through 55 and Figures 43 and 44 contain the results of regressions on sub-samples of each year of university completed. As in Espírito Santo, there is a tendency for the explained variance to decrease as educational levels increase. The influence of other variables has been discussed in connection with the sub-samples by Course Completed and no major changes result from this alternative grouping.

TABLE 49

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF ALL OTHER COURSES

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	149						intercept		35,690		intercept		33,394
z_4 - 4 years	30					-0.12143	-0.26792	-1.85384	27,302	-0.12143	-0.02146	-0.15310	32,684
z_5 - 5 years	10					-0.09506	-0.36266	-1.56201	24,834	-0.09506	-0.12145	-0.50916	29,574
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	18	-0.10706	-0.31055	-1.67452	24,607	-0.10706	-0.35696	-1.92623	24,976	-0.10706	-0.16437	-1.02873	28,332
z_9 - 27 " "	48	0.05400	-0.02010	-0.14876	32,900	0.05400	-0.06268	-0.46061	33,522	0.05400	-0.11866	-1.04454	29,657
z_{10} - 32 " "	30	0.04275	-0.01613	-0.10400	33,031	0.04275	-0.03539	-0.22783	34,450	0.04275	-0.01891	-0.14843	32,768
z_{11} - 39 " "	54		intercept		33,569		intercept		35,690		intercept		33,394
z_{12} - 49 " "	24	-0.04799	-0.17030	-1.01874	28,312	-0.04799	-0.07789	-0.45140	33,016	-0.04799	0.12589	0.84829	37,874
z_{13} - 59 " "	13	-0.02783	-0.15418	-0.73240	28,772	-0.02783	-0.06392	-0.30021	33,481	-0.02783	0.06281	0.34273	35,558
z_{14} - 68 " "	5	-0.12208	-0.59238	-1.85969	18,564	-0.12208	-0.60008	-1.89922	19,586	-0.12208	-0.29726	-1.16468	24,806
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	192												
Sex													
z_{25} - Female	15									-0.48364	-0.77001	-3.04591	15,461
z_{26} - Male	176										intercept		33,394
Head of Family													
z_{27} - Not Head	20									-0.22760	-0.16181	-1.12230	28,405
z_{28} - Head	170										intercept		33,394

Religion					
z_{29}- Protestant	7			0.08694	0.34579	1.61889	47,189
z_{30}- Jewish	0						
z_{31}- Other	23			-0.12160	-0.09927	-0.76051	30,238
z_{32}- Roman Catholic	162				intercept		33,394
Race							
z_{33}- Black	1			-0.07667	0.71214	1.23856	48,088
z_{34}- White	191				intercept		33,394
z_{35}- Other	27			-0.22292	-0.08369	-0.66604	30,712
Children							
z_{36}- Has Children	119			0.15416	0.06236	0.63590	35,543
z_{37}- No Children	73				intercept		33,394
Class of Activity							
z_{38}- Agriculture	11			-0.35188	-0.77259	-2.39278	15,622
z_{39}- Extractive	5			0.00967	0.18295	0.47823	40,098
z_{40}- Mfg. Industry	5			0.03986	0.19561	0.58432	40,609
z_{41}- Commerce and Transportation	8			-0.05883	-0.07186	-0.21196	31,079
z_{42}- Service Industries	4			-0.31149	-0.96916	-2.46904	12,670
z_{43}- Government or Other	140				intercept		33,394
z_{44}- Liberal Professions	6			0.08814	0.43720	1.18304	51,706
z_{45}- Social Services	13			-0.31941	-0.28625	-1.20557	25,081
Position							
z_{46}- Public Employee	148				intercept		33,394
z_{47}- Employer or Own Account	23			-0.28020	-0.34088	-1.17366	23,768
z_{48}- Private Employee	21			-0.25378	-0.29186	-1.15143	24,941
Migration							
z_{49}- No Migration	75			0.10323	0.12689	1.53660	37,912
z_{50}- From Rural	8			-0.05046	-0.16054	-0.80468	28,441
z_{51}- From Urban	107				intercept		33,394
Environment							
z_{52}- Urban	117			0.19922	0.15920	1.14935	39,157
z_{53}- Suburban	43			0.01165	0.03906	0.25641	34,724
z_{54}- Rural	31				intercept		33,394
Analysis of Variance							
"F" Value		1.13928		1.50132		6.25996	
$R^2(\bar{R}^2)$		.08543 (.00971)		.06159 (.02590)		.51814 (.43852)	
Std. Error of Estimate		0.68141		0.67584		0.51314	

Fig. 42

BRAZIL, NORTHERN REGION - AGE/INCOME PROFILES - 1960

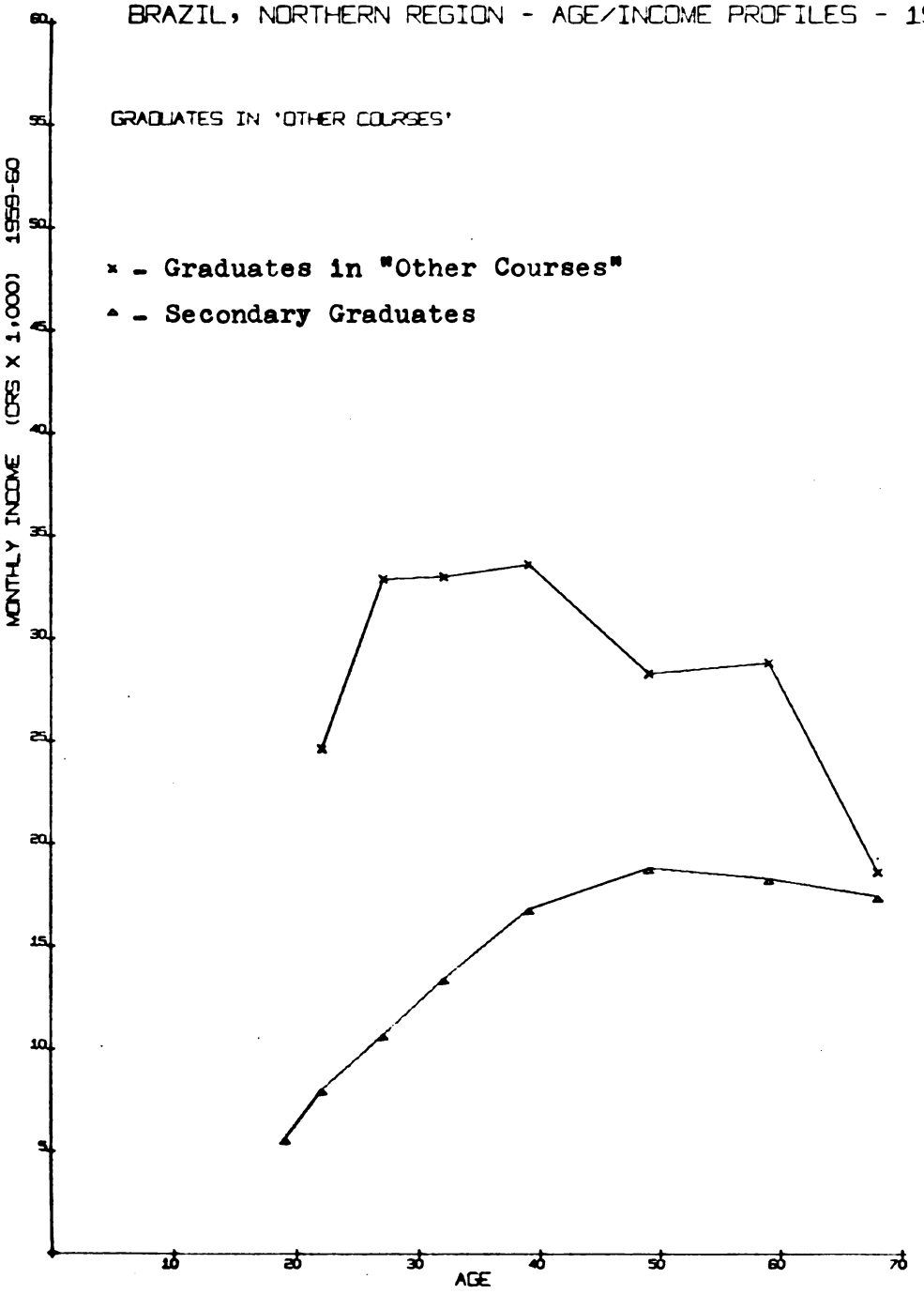


TABLE 50

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 1 YEAR UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Leg.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Leg.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Leg.Inc.
Years of University Completed													
z_1 - 1 year	53												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	5	-0.35989	-1.42388	-3.94733	5,517	-0.35989	-1.64241	-2.95665	2,990				
z_8 - 22 " "	14	-0.36696	-1.03790	-3.70104	8,116	-0.36696	-1.10410	-2.54631	5,172				
z_9 - 27 " "	11	-0.01738	-0.59361	-2.01902	12,655	-0.01738	-0.89308	-2.43424	6,325				
z_{10} - 32 " "	7	0.13574	-0.30029	-0.91699	16.969	0.13574	-0.66074	-1.51378	7,980				
z_{11} - 39 " "	8		intercept		22,913		intercept		15,450				
z_{12} - 49 " "	7	0.27223	-0.05158	-0.09645	22,200	0.27223	0.34442	0.93333	21,802				
z_{13} - 59 " "	1	0.17998	0.42364	0.63125	33,000	0.17998	0.35996	0.56670	22,143				
z_{14} - 68 " "	0												
Course Completed													
z_{15} - Secondary	52						intercept		15,450				
z_{16} - Philosophy	1					0.02998	-0.57452	-0.88535	8,698				
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	7					-0.42061	-0.20405	-0.43755	12,599				
z_{26} - Male	46						intercept		15,450				
Head of Family													
z_{27} - Not Head	22					-0.49906	0.04297	0.15740	16,128				
z_{28} - Head	31						intercept		15,450				

Religion				
x_{29}- Protestant	2		-0.09825 -0.02766 -0.06395 15,008	
x_{30}- Jewish	0			
x_{31}- Other	3		0.06914 -0.49289 -3.24272 9,4375	
x_{32}- Roman Catholic	48		intercept 15,450	
Race				
x_{33}- Black	0			
x_{34}- White	29		intercept 15,450	
x_{35}- Other	24		0.05429 0.08719 0.40424 16,897	
Children				
x_{36}- Has Children	19		0.43329 -0.00069 -0.00281 15,439	
x_{37}- No Children	34		intercept 15,450	
Class of Activity				
x_{38}- Agriculture	0			
x_{39}- Extractive	1		0.36855 1.31406 1.57115 57,495	
x_{40}- Mfg. Industry	7		0.07426 -0.41297 -1.05086 10,225	
x_{41}- Commerce and Transportation	23		0.12051 -0.64177 -1.79529 8,132	
x_{42}- Service Industries	1		0.02598 -0.27968 -0.37680 11,680	
x_{43}- Government or Other	12		intercept 15,450	
x_{44}- Liberal Professions	1		-0.08752 -1.09765 -1.50950 5,195	
x_{45}- Social Services	8		-0.38792 -0.35277 0.81754 10,858	
Position				
x_{46}- Public Employee	21		intercept 15,450	
x_{47}- Employer or Own Account	6		0.16530 0.18132 0.38256 18,521	
x_{48}- Private Employee	26		0.11040 0.81457 2.16393 34,889	
Migration				
x_{49}- No Migration	35		-0.15465 -0.77631 -3.15156 7,108	
x_{50}- From Rural	7		-0.07845 -0.74033 -2.08234 7,369	
x_{51}- From Urban	11		intercept 15,450	
Environment				
x_{52}- Urban	31		0.13802 1.06198 1.64829 44,682	
x_{53}- Suburban	20		-0.15489 1.21846 1.81364 52,251	
x_{54}- Rural	2		intercept 15,450	
Analysis of Variance				
"F" Value		5.34566	3.09247	
R^2 ($\bar{R}^2$)		.41088 (.34813)	.78115 (.51928)	
Std. Error of Estimate		0.63274	0.54761	

TABLE 57

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 2 YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression n°1				Regression n° ?				Regression n°			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	53												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	19	-0.49206	-0.89937	-3.71810	7,720	-0.49206	-0.30591	-0.75495	4,611				
z_9 - 27 " "	13	-0.05161	-0.47561	-1.85485	11,793	-0.05161	0.16660	0.36723	7,396				
z_{10} - 32 " "	6	0.06752	-0.26696	-0.84734	14,530	0.06752	0.10819	0.27101	6,976				
z_{11} - 39 " "	9		intercept		18,975		intercept		6,261				
z_{12} - 49 " "	4	0.24928	0.24323	0.67711	24,200	0.24928	0.82205	1.99717	14,845				
z_{13} - 59 " "	2	0.40992	1.13711	2.43337	59,160	0.40992	1.16001	2.58322	19,972				
z_{14} - 68 " "	0												
Course Completed													
z_{15} - Secondary	53												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	9					-0.26179	-0.28819	-1.00416	4,693				
z_{26} - Male	44						intercept		6,261				
Head of Family													
z_{27} - Not Head	30					-0.63478	-0.51993	-1.47238	3,725				
z_{28} - Head	23						intercept		6,261				

Religion							
x_{29}- Protestant	4		0.06681	-0.29640	-0.78588	4,695	
x_{30}- Jewish	1		-0.78644	-1.05751	-1.55277	2,218	
x_{31}- Other	2		0.07689	0.09586	0.11791	6,877	
x_{32}- Roman Catholic	46			Intercept		6,261	
Race							
x_{33}- Black	2		0.06588	-0.05553	-0.08253	5,993	
x_{34}- White	39			Intercept		6,261	
x_{35}- Other	12		0.16496	0.36602	1.21367	8,830	
Children							
x_{36}- Has Children	19		0.50861	0.03955	0.13547	6,475	
x_{37}- No Children	34			Intercept		6,261	
Class of Activity							
x_{38}- Agriculture	1		-0.08465	-1.26193	-1.10592	1,775	
x_{39}- Extractive	2		0.06588	0.06639	0.12295	6,691	
x_{40}- Mfg. Industry	2		0.15827	0.21564	0.38008	7,768	
x_{41}- Commerce and Transportation	23		0.28093	0.05490	0.12884	6,614	
x_{42}- Service Industries	1			Intercept		6,261	
x_{43}- Government or Other	11			Intercept		6,261	
x_{44}- Liberal Professions	5		0.05824	0.10075	0.21205	6,925	
x_{45}- Social Services	8		-0.22810	0.09716	0.30121	6,900	
Position							
x_{46}- Public Employee	19			Intercept		6,261	
x_{47}- Employer or Own Account	9		0.40362	0.22847	0.61632	7,868	
x_{48}- Private Employee	25		-0.18456	0.21155	0.63663	7.756	
Migration							
x_{49}- No Migration	36		-0.29835	-0.14614	-0.56864	5,410	
x_{50}- From Rural	2		0.07489	0.25576	0.45564	8,082	
x_{51}- From Urban	15			Intercept		6,261	
Environment							
x_{52}- Urban	44		0.07812	0.95627	1.21588	16,291	
x_{53}- Suburban	7		-0.01860	0.50623	0.57133	10,388	
x_{54}- Rural	2			Intercept		6,261	
Analysis of Variance							
"F" Value		7.12810		3.53895			
$R^2(\bar{R}^2)$		.45127 (.38388)		.75596 (.54605)			
Std. Error of Estimate		0.59777		0.51705			

TABLE 52

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 3 YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	265												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	25	-0.13418	-0.38279	-2.39225	19,372	-0.13418	-0.41943	-2.90617	11,720	-0.13418	-0.09053	-0.62958	17,380
z_9 - 27 " "	67	-0.08778	-0.19821	-1.69667	23,299	-0.08778	-0.22705	-2.21679	14,206	-0.08778	-0.15087	-1.51036	16,362
z_{10} - 32 " "	44	0.09764	0.05947	0.45127	30,148	0.09764	0.07990	0.69721	19,310	0.09764	0.03597	0.34466	19,723
z_{11} - 39 " "	73		intercept		28,407		intercept		17,827		intercept		19,027
z_{12} - 49 " "	34	0.05600	0.00868	0.06057	28,695	0.05600	0.16953	1.34284	21,120	0.05600	0.14280	1.23157	21,947
z_{13} - 59 " "	11	0.00952	-0.06114	-0.27379	26,722	0.00952	0.02678	0.13677	18,311	0.00952	0.11712	0.64853	21,391
z_{14} - 68 " "	11	-0.08205	-0.36777	-1.64676	19,665	-0.08205	-0.13941	-0.70922	15,507	-0.08205	-0.22759	-1.31292	15,157
Course Completed													
z_{15} - Secondary	23						intercept		17,827		intercept		19,027
z_{16} - Philosophy	6					-0.19048	-0.46517	-1.67232	11,196	-0.19048	-0.14773	-0.54763	16,413
z_{17} - Medicine	0												
z_{18} - Pharmacy	14					-0.25014	-0.31130	-1.48753	13,058	-0.25014	-0.23834	-1.23811	14,992
z_{19} - Dentistry	73					-0.14601	0.21016	1.39579	21,996	-0.14601	0.31340	1.96969	26,039
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	149					0.42878	0.72671	5.30878	36,871	0.42878	0.56797	4.05689	33,576
Sex													
z_{25} - Female	34									-0.42616	-0.99051	-3.58969	10,542
z_{26} - Male	241										intercept		19,027
Head of Family													
z_{27} - Not Head	46									-0.39721	-0.25347	-2.23876	15,065
z_{28} - Head	218										intercept		19,027

Religion				
z_{29}- Protestant	9			-0.02634 0.08059 0.41780 20,044
z_{30}- Jewish	0			0.04678 0.06163 0.49119 20,136
z_{31}- Other	21			Intercept 19,027
z_{32}- Roman Catholic	255			
Race				
z_{33}- Black	1			-0.04818 0.12586 0.22386 21,979
z_{34}- White	221			Intercept 19,027
z_{35}- Other	43			-0.15684 -0.17075 -1.74497 16,080
37				
Children				
z_{36}- Has Children	170			0.25318 0.13661 1.57662 21,812
z_{37}- No Children	95			Intercept 19,027
Class of Activity				
z_{38}- Agriculture	2			-0.14692 -1.32608 -2.88451 5,672
z_{39}- Extractive	5			-0.07484 -0.02510 -0.07655 18,998
z_{40}- Mfg. Industry	2			0.01109 0.71276 1.61923 38,807
z_{41}- Commerce and Transportation	19			-0.05751 -0.05040 -0.21895 18,691
z_{42}- Service Industries	4			-0.22708 -0.89205 -2.58999 7,798
z_{43}- Government or Other	150			Intercept 19,027
z_{44}- Liberal Professions	97			-0.17601 -0.27986 -1.06095 14,678
z_{45}- Social Services	26			-0.30850 -0.14628 -0.87662 16,497
Position				
z_{46}- Public Employee	166			Intercept 19,027
z_{47}- Employer or Own Account	66			-0.22576 -0.04902 -0.22533 18,116
z_{48}- Private Employee	35			-0.29190 -0.10431 -0.54946 17,362
Migration				
z_{49}- No Migration	125			-0.03942 -0.05877 -0.56211 18,368
z_{50}- From Rural	8			-0.07065 -0.31022 -1.50606 13,992
z_{51}- From Urban	133			Intercept 19,027
Environment				
z_{52}- Urban	195			0.00823 0.14958 1.03863 22,092
z_{53}- Suburban	53			0.02779 0.05572 0.22898 19,719
z_{54}- Rural	19			Intercept 19,027
Analysis of Variance				
"F" Value		1.98844	10.88416	8.47704
$R^2(\bar{R}^2)$		.04120 (.02576)	.29216 (.26719)	.51990 (.46066)
Std. Error of Estimate		0.69051	0.59889	0.51586

Fig. 43

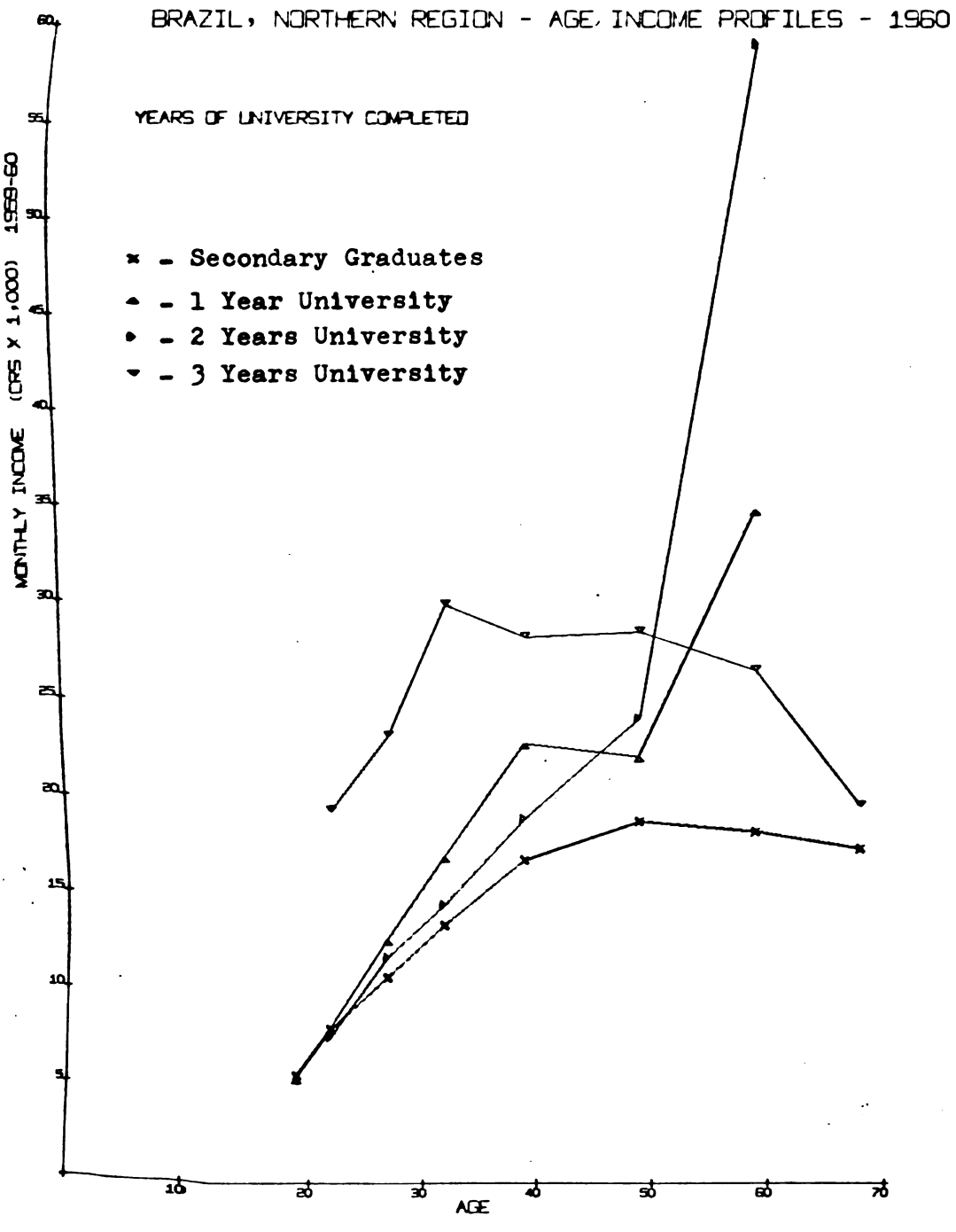

BRAZIL, NORTHERN REGION - AGE, INCOME PROFILES - 1960
YEARS OF UNIVERSITY COMPLETED
× - Secondary Graduates
▲ - 1 Year University
● - 2 Years University
▼ - 3 Years University
MONTHLY INCOME (CR$ X 1,000) 1959-60
60
55
50
45
40
35
30
25
20
15
10
5
10
20
30
40
50
60
70
AGE

TABLE 53

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 4 YEARS UNIVERSITY

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	276												
x_5 - 5 years	0												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	19	-0.20608	-0.70666	-3.56661	11,022	-0.20608	-0.75990	-3.66863	12,420	-0.20608	-0.32150	-1.42434	8,354
x_9 - 27 " "	44	-0.09944	-0.29501	-1.99701	16,635	-0.09944	-0.28732	-1.87558	19,923	-0.09944	-0.05523	-0.34388	10,903
x_{10} - 32 " "	40	0.04219	-0.03784	-0.24873	21,513	0.04219	-0.03558	-0.23262	25,627	0.04219	-0.03784	-0.24936	11,099
x_{11} - 39 " "	68		intercept		22,343		intercept		26,555		intercept		11,522
x_{12} - 49 " "	61	0.06664	-0.02024	-0.15035	21,895	0.06664	-0.04668	-0.34285	25,344	0.06664	-0.10423	-0.76957	10,382
x_{13} - 59 " "	31	0.03467	-0.04172	-0.25216	21,430	0.03467	-0.06266	-0.37829	24,942	0.03467	-0.07522	-0.46371	10,687
x_{14} - 68 " "	13	-0.01001	-0.15251	-0.65985	19,183	-0.01001	-0.14997	-0.64659	22,857	-0.01001	-0.12908	-0.57152	10,127
Course Completed													
x_{15} - Secondary	24						intercept		26,555		intercept		11,522
x_{16} - Philosophy	46					-0.14883	-0.41320	-2.06723	17,567	-0.14883	-0.12626	-0.55072	10,156
x_{17} - Medicine	0												
x_{18} - Pharmacy	21					-0.04347	-0.23846	-1.00904	20,921	-0.04347	-0.19270	-0.76041	9,503
x_{19} - Dentistry	47					-0.00020	-0.19929	-0.97438	21,757	-0.00020	-0.22410	-1.01654	9,209
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	79					0.04975	-0.14432	-0.73963	22,986	0.04975	-0.04956	-0.25005	10,965
x_{23} - Econ./Pol. Science	29					0.05685	-0.09711	-0.16826	25,588	0.05685	0.04302	0.19084	12,029
x_{24} - All other courses completed except Seminary	30					0.11165	0.05962	0.19008	27,463	0.11165	0.22480	1.00704	14,427
Sex													
x_{25} - Female	34									-0.20708	-0.07069	-0.41264	10,756
x_{26} - Male	242										intercept		11,522
Head of Family													
x_{27} - Not Head	65									-0.24754	-0.24899	-1.78529	8,965
x_{28} - Head	211										intercept		11,522

Religion						
z_{29} Protestant	29			0.07802	0.26959	1.30998	15,685
z_{30} Jewish	2				Intercept		11,522
z_{31} Other	29				Intercept		11,522
z_{32} Roman Catholic	216			-0.10141	-0.10908	-0.79644	10,330
Race						
z_{33} Black	0						
z_{34} White	188			0.06844	0.13698	1.31555	13,214
z_{35} Other	88				Intercept		11,522
Children						
z_{36} Has Children	179			0.29912	0.36299	3.86821	16,565
z_{37} No Children	97				Intercept		11,522
Class of Activity						
z_{38} Agriculture	25			0.05023	0.42856	1.94805	17,684
z_{39} Extractive	16			0.06701	0.37933	1.63629	16,298
z_{40} Mfg. Industry	10			0.04608	0.55560	2.09895	20,685
z_{41} Commerce and Transportation	66			0.08264	0.42016	2.28306	17,539
z_{42} Service Industries	5				Intercept		11,522
z_{43} Government or Other	63				Intercept		11,522
z_{44} Liberal Professions	36			0.03929	0.58613	2.97809	20,706
z_{45} Social Services	55			-0.16823	0.04583	0.27781	12,063
Position						
z_{46} Public Employee	101			-0.03965	0.25899	1.71908	14,989
z_{47} Employer or Own Account	95			0.07490	0.01042	0.07770	11,645
z_{48} Private Employee	80				Intercept		11,522
Migration						
z_{49} No Migration	159			-0.02763	0.05119	0.50074	12,128
z_{50} From Rural	12			0.09042	0.41816	1.85644	17,564
z_{51} From Urban	124				Intercept		11,522
Environment						
z_{52} Urban	195			0.11558	0.13116	0.95122	13,177
z_{53} Suburban	37			-0.18322	-0.22877	-1.30855	9,166
z_{54} Rural	42				Intercept		11,522
Analysis of Variance						
"F" Value		2.84315	2.19095		2.62688	
$R^2(\bar{R}^2)$		.05965 (.04223)	.09118 (.05332)		.24333 (.15414)	
Std. Error of Estimate		0.76994	0.79913		0.71767	

TABLE 54

BRAZIL, NORTH REGION

REGRESSIONS OF LOG INCOME FROM SAMPLE OF 5 YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	439												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	13	-0.16723	-0.85345	-4.11679	16,043	-0.16723	-0.37648	-4.22652	8,207	-0.16723	-0.75060	-3.47534	9,501
z_9 - 27 " "	61	-0.14558	-0.42265	-3.80624	24,682	-0.14558	-0.40034	-3.61169	13,212	-0.14558	-0.30314	-2.62181	14,864
z_{10} - 32 " "	107	-0.04083	-0.20905	-2.24763	30,559	-0.04083	-0.20838	-2.27015	16,008	-0.04083	-0.24082	-2.65569	15,820
z_{11} - 39 " "	134		intercept		37,665		intercept		19,717		intercept		20,127
z_{12} - 49 " "	70	0.04461	-0.08130	-0.76744	34,724	0.04461	-0.03112	-0.29386	19,113	0.04461	-0.02621	-0.25615	19,606
z_{13} - 59 " "	33	-0.00099	-0.15900	-1.14556	32,127	-0.00099	-0.11978	-0.86076	17,491	-0.00099	-0.10782	-0.78232	18,070
z_{14} - 68 " "	21	0.07118	0.07475	0.44618	40,589	0.07118	0.05488	0.33186	20,830	0.07118	0.12068	0.74493	22,709
Course Completed													
z_{15} - Secondary	5						intercept		19,717	-	intercept		20,127
z_{16} - Philosophy	0												
z_{17} - Medicine	1					0.00544	0.69358	0.88918	39,451	0.00544	0.55390	0.73400	35,022
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	170					0.12845	0.78001	2.39955	43,012	0.12845	0.51963	1.61255	33,842
z_{21} - Law	253					-0.07714	0.56448	1.73718	34,673	-0.07714	0.49369	1.57832	32,975
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	1						intercept		19,717		intercept		20,127
z_{24} - All other courses completed except Seminary	10					-0.06684	0.28127	0.71544	26,121	-0.06684	-0.36798	-0.93639	29,080
Sex													
z_{25} - Female	17									-0.15252	-0.34438	-1.87642	14,235
z_{26} - Male	422										intercept		20,127
Head of Family													
z_{27} - Not Head	82									-0.24669	-0.30335	-2.83680	14,960
z_{28} - Head	356										intercept		20,127

Religion				
x_{29}- Protestant	16			0.05661 -0.15594 -0.83671 17,221
x_{30}- Jewish	6			0.07545 0.28369 1.00529 24,730
x_{31}- Other	38			-0.06192 -0.14090 -1.14702 17,182
x_{32}- Roman Catholic	379			intercept 20,127
Race				
x_{33}- Black	0			intercept 20,127
x_{34}- White	395			0.08395 -0.13434 -1.71600 27,999
x_{35}- Other	108			
Children				
x_{36}- Has Children	310			0.08998 -0.11847 -1.43201 17,878
x_{37}- No Children	129			intercept 20,127
Class of Activity				
x_{38}- Agriculture	6			-0.12312 -0.35645 -1.08029 14,092
x_{39}- Extractive	25			0.14956 0.70823 3.59400 40,866
x_{40}- Mfg. Industry	47			0.10504 0.40338 2.76606 30,128
x_{41}- Commerce and Transportation	49			-0.06850 0.00817 0.04155 20,252
x_{42}- Service Industries	2			0.00771 0.02551 0.05115 20,648
x_{43}- Government or Other	140			intercept 20,127
x_{44}- Liberal Professions	142			0.09002 0.42222 2.84385 30,701
x_{45}- Social Services	28			-0.08419 -0.01802 -0.12369 19,768
Position				
x_{46}- Public Employee	184			intercept 20,127
x_{47}- Employer or Own Account	150			-0.00224 -0.22498 -1.62757 16,072
x_{48}- Private Employee	105			0.11598 0.00331 0.02629 20,194
Migration				
x_{29}- No Migration	270			-0.08882 -0.08515 -1.12760 18,484
x_{30}- From Rural	13			-0.01952 -0.10782 -0.53839 18,070
x_{31}- From Urban	155			intercept 20,127
Environment				
x_{52}- Urban	376			0.04041 0.24343 1.78907 25,670
x_{53}- Suburban	27			0.00135 0.21109 1.06765 24,858
x_{54}- Rural	35			intercept 20,127
Analysis of Variance				
"F" Value		5.11320	4.73500	3.88972
$R^2(\bar{R}^2)$		.06708 (.05627)	.10067 (.08182)	.22453 (.16955)
Std. Error of Estimate		0.71317	0.70850	0.66927

TABLE 55

BRAZIL, NORTH REGION

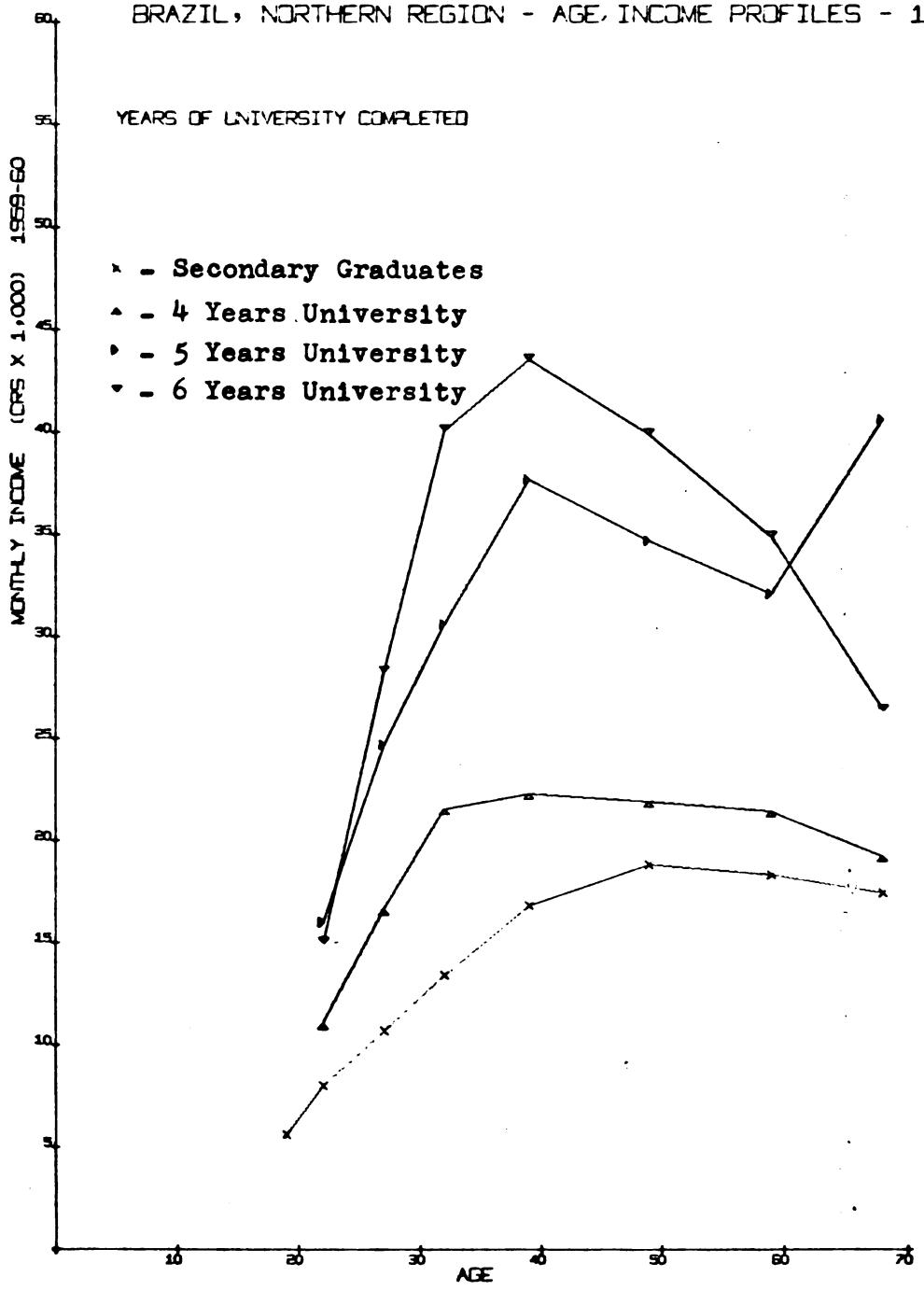
REGRESSIONS OF LOG INCOME FROM SAMPLE OF 6 YEARS UNIVERSITY

Variable Number and Description	Sample Size	Regression nº 1				Regression nº 2				Regression nº 3			
		Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.	Simp.Corr. Coef.	Regr. Coef.	"T" Value	Antilog Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	152												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	1	-0.11761	-1.06924	-1.65367	15,000	-0.11761	-1.04424	-1.61526	15,000	-0.11761	-0.92747	-1.33039	10,306
z_9 - 27 " "	23	-0.19494	-0.43017	-2.66889	28,307	-0.19494	-0.41728	-2.56399	28,078	-0.19494	-0.34156	-1.60695	18,516
z_{10} - 32 " "	26	0.03577	-0.08123	-0.52505	40,126	0.03577	-0.06761	-0.43124	39,859	0.03577	-0.02651	-0.15459	25,375
z_{11} - 39 " "	49		intercept		43,522		intercept		42,618		intercept		26,055
z_{12} - 49 " "	41	0.04348	-0.08589	-0.63636	39,940	0.04348	-0.06488	-0.47231	39,940	0.04348	-0.04779	-0.33008	24,839
z_{13} - 59 " "	9	-0.03427	-0.22028	-0.95252	34,918	-0.03427	-0.19927	-0.85482	34,918	-0.03427	-0.26260	-1.00799	20,038
z_{14} - 68 " "	3	-0.08093	-0.50058	-1.31930	26,387	-0.08093	-0.47937	-1.25784	26,387	-0.08093	-0.44058	-1.11795	16,771
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	146						intercept		42,618		intercept		26,055
z_{18} - Pharmacy	4					0.04496	0.18668	0.57146	51,365	0.04496	0.54747	1.44108	45,047
z_{19} - Dentistry	1					-0.01082	-0.19694	-0.30464	34,999	-0.01082	-0.64821	-0.88407	13,626
z_{20} - Engineering	0												
z_{21} - Law	1					0.12149	0.85288	1.31926	99,998	0.12149	0.34302	0.43586	36,717
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	13									-0.10241	0.02870	0.12940	26,814
z_{26} - Male	139										intercept		26,055
Head of Family													
z_{27} - Not Head	21									-0.15992	-0.13205	-0.68042	22,832
z_{28} - Head	131										intercept		26,055

Religion						
x_{29}- Protestant	1			-0.01082	0.80176	0.99756	38,089
x_{30}- Jewish	2			0.07851	0.66738	1.37880	30,786
x_{31}- Other	5			0.15339	0.50002	1.44695	42,939
x_{32}- Roman Catholic	144				Intercept		26,055
Race						
.	0						
x_{34}- White	116			-0.09629	-0.08834	-0.62638	25,900
x_{35}- Other	36				Intercept		26,055
Children						
x_{36}- Has Children	113			0.17510	0.08425	0.52465	28,365
x_{37}- No Children	39				Intercept		26,055
Class of Activity						
x_{38}- Agriculture	0						
x_{39}- Extractive	1			-0.01082	0.70774	0.67480	32,877
x_{40}- Mfg. Industry	0						
x_{41}- Commerce and Transportation	4			0.08496	-0.37112	-0.75453	17,977
x_{42}- Service Industries	0						
x_{43}- Government or Other	18				Intercept		26,055
x_{44}- Liberal Professions	74			0.06113	-0.53338	-1.25848	15,248
x_{45}- Social Services	55			-0.07911	-0.16302	-0.86690	22,136
Position						
x_{46}- Public Employee	70			-0.10750	-0.04020	-0.12913	25,089
x_{47}- Employer or Own Account	75			0.10160	0.50241	1.32140	43,062
x_{48}- Private Employee	9				Intercept		26,055
Migration						
x_{49}- No Migration	88			0.02858	0.01527	0.12113	26,456
x_{50}- From Rural	5			0.04701	0.39575	1.12949	38,704
x_{51}- From Urban	57				Intercept		26,055
Environment						
x_{52}- Urban	140			0.13498	0.58067	0.80051	46,567
x_{53}- Suburban	10			-0.10598	0.01356	0.01768	26,411
x_{54}- Rural	2				Intercept		26,055
Analysis of Variance						
"F" Value		1.80377	1.43484		1.10248	
R^2 ($\bar{R}^2$)		.06945 (.03759)	.08336 (.03209)		.18654 (.02515)	
Std. Error of Estimate		0.63769	0.63956		0.64215	

Fig. 44

BRAZIL, NORTHERN REGION - AGE, INCOME PROFILES - 1960



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THE GUANABARA STUDY

Table 56 compares the several professional populations and employed sub-samples from the State of Guanabara used in the study. In contrast to other areas, the aggregate employed sample is substantially less than twenty-five percent of total population. This is due to the relatively large number of persons with secondary and university education who are retired or otherwise not actively employed in the labor market. The total number of records contained in the sample is 52,347 or 26.1 percent of the population with secondary schooling or more, while the employed sample is only 36,253 or 18.1 percent. The general level of wages for secondary and university graduates in Guanabara is considerably higher than in the other areas. This may make it possible for graduates to take more leisure or spend more time in non-market activities, particularly such groups as housewives. This possibility is supported by the fact that two of the professional groups with the smallest representation in the sub-samples, Philosophy and Pharmacy graduates, have large proportions of females in the graduating classes. Table 57 contains the variable key and observation cell sizes.

Total Sample.--Table 58 contains the regressions of log income using the total sample of university and secondary graduates. As with the North Region, approximately one-third

TABLE 56

GUANABARA
POPULATION AND SAMPLE COMPOSITION

Census Code (1)	Course (2)	Total Pop.[b] (3)	Employed Sample (4)	(4) as Percent of (3) (5)
50-54	Philosophy	7,247	1,240	17.1
60	Medicine	10,195	2,358	23.1
61	Pharmacy	1,755	317	18.1
62	Dentistry	4,348	999	23.0
64	Engineering	9,174	2,191	23.8
67	Law	14,216	3,227	22.7
68	Agronomy	628	146	23.2
70	Economic and Political Sciences	2,674	654	24.5
	"Other Courses"			
	Architecture	1,424		
	Domestic Arts	12		
	Fine Arts	240		
	Statistics	160		
	Seminary[a]	488		
	Physical Education	160		
	Military	11,440		
	Industrial Chemistry	800		
	Sanitary Services	592		
	Veterinary	561		
	"Other Courses" Total	15,877	3,866	24.3
	Grand Totals	66,114	14,998	22.7
	Secondary Graduates	134,733	21,255	15.8

[a]Not included in study.

[b]Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, Censo Demográfico de 1960. (Rio de Janeiro: 1967)

[c]Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, VII Recenseamento Geral do Brasil 1960, 25 Percent Sample.

TABLE 57

VARIABLE KEY AND SAMPLE COMPOSITION
STATE OF GUANABARA

Variable Number and Description	SAMPLE COMPOSITION																	
	Total	Total univ.	Total second.	1 yr. univ.	2 yrs. univ.	3 yrs. univ.	4 yrs. univ.	5 yrs. univ.	6 yrs. univ.	Phil.	Medic.	Pharm.	Dent.	Engin.	Law	Agron.	Econ. Pol.Sc.	Other Univ. Courses
Years of University Completed																		
x_1 - 1 year	405	1	404	408	0	0	0	0		0	0	0	0	0	0	0	0	1
x_2 - 2 years	486	13	473	0	448	0	0	0		0	0	0	0	0	0	0	0	13
x_3 - 3 years	3776	3329	447	0	0	2,778	0	0		119	0	92	195	0	0	0	0	2923
x_4 - 4 years	3603	3361	222	0	0	0	3,488	0		1120	0	225	804	0	0	186	694	511
x_5 - 5 years	5829	5779	50	0	0	0	0	5829		0	0	0	0	2191	3227	0	0	361
x_6 - 6 years	2373	2373	0	0	0	0	0	0		0	2358	0	0	0	0	0	0	15
Age																		
x_7 - 19 years midpoint	319	1	318	18	1	0	0	0		0	0	0	0	0	0	0	0	1
x_8 - 22 " "	4283	511	3772	148	117	288	149	107		86	28	5	17	42	46	2	11	27h
x_9 - 27 " "	6950	2018	4532	108	109	877	880	706		233	302	48	128	265	395	8	98	580
x_{10} - 32 " "	6359	2528	3815	88	88	488	688	1000		290	330	55	177	396	507	13	122	634
x_{11} - 39 " "	5168	1436	4732	68	88	1,184	1,087	1724		340	604	59	325	615	1007	48	286	1192
x_{12} - 49 " "	5880	3275	2605	88	40	488	684	1274		168	695	77	206	880	764	34	116	775
x_{13} - 59 " "	2798	1619	1179	18	88	208	288	718		94	286	49	94	327	361	30	49	329
x_{14} - 68 " "	916	614	302	7	4	78	121	300		28	113	24	52	106	187	11	12	81
Course Completed																		
x_{15} - Secondary	21255	0	21255	404	488	447	888	50		0	0	0	0	0	0	0	0	0
x_{16} - Philosophy	1280	1280	0	0	0	118	1,121	0		1239	0	0	0	0	0	0	0	0
x_{17} - Medicine	2358	2358	0	0	0	0	0	0		0	2358	0	0	0	0	0	0	0
x_{18} - Pharmacy	317	317	0	0	0	88	888	0		0	0	317	0	0	0	0	0	0
x_{19} - Dentistry	999	999	0	0	0	188	824	0		0	0	0	999	0	0	0	0	0
x_{20} - Engineering	2191	2191	0	0	0	0	0	2191		0	0	0	0	2191	0	0	0	0
x_{21} - Law	3227	3227	0	0	0	0	0	3227		0	0	0	0	0	3227	0	0	0
x_{22} - Agronomy	186	186	0	0	0	0	188	0		0	0	0	0	0	0	186	0	0
x_{23} - Econ./Pol. Science	694	694	0	0	0	0	684	0		0	0	0	0	0	0	0	694	0
x_{24} - All other courses completed except Seminary	3866	3866	0	1	18	2,988	811	361		0	0	0	0	0	0	0	0	3866
Sex																		
x_{25} - Female	8729	1602	7127	64	78	208	870	252		569	217	78	123	30	183	7	57	337
x_{26} - Male	27524	13396	14128	841	288	2,280	2,818	5577		670	2141	239	876	2161	3044	179	597	3529

Head of Family																		
z_{27} - Not Head	13687	3309	10378	894	198	888	1,189	1063	590	689	91	266	396	616	18	139	772
z_{28} - Head	22566	11689	10877	881	889	8,811	8,490	4766	649	1869	286	739	1895	8811	188	584	3898
Religion																		
z_{29} - Protestant	1490	668	822	18	16	189	884	281	88	51	15	58	179	86	8	93	197
z_{30} - Jewish	1068	537	511	8	18	88	178	265	58	94	14	88	147	81	2	41	99
z_{31} - Other	3836	1736	2108	88	84	418	681	652	169	269	88	123	286	396	13	90	645
z_{32} - Roman Catholic	29879	12857	17822	897	881	8,188	8,780	4951	924	1944	266	804	1619	2704	125	468	3895
Race																		
z_{33} - Black	280	67	213	6	8	29	81	22	8	8	3	7	5	13	0	2	81
z_{34} - White	34617	14604	20013	872	417	8,648	8,897	5692	1202	2514	302	965	2144	3149	145	633	3732
z_{35} - Other	1305	307	998	87	88	188	89	106	28	33	12	27	38	69	2	18	88
Children																		
z_{36} - Has Children	20399	9937	10462	141	188	2,088	2,818	3842	657	1582	195	685	1470	2118	107	419	2727
z_{37} - No Children	15854	5061	10795	884	881	1,188	1,687	1987	602	776	124	316	721	1109	39	255	1139
Class of Activity																		
z_{38} - Agriculture	91	45	46	8	1	8	18	22	1	2	1	1	10	9	13	2	6
z_{39} - Extractive	115	49	66	8	8	4	28	36	3	0	0	1	30	2	2	4	7
z_{40} - Mfg. Industry	4136	1901	2635	68	68	188	600	1017	79	37	66	21	670	228	12	180	892
z_{41} - Commerce, Transportation	8212	1572	6640	197	188	896	808	781	117	69	129	49	297	495	23	254	179
z_{42} - Service Industries	1089	177	912	18	18	48	78	82	24	8	2	4	27	51	3	19	39
z_{43} - Government or Other	8930	4966	3964	91	188	2,707	687	1285	138	406	52	136	336	826	73	129	2870
z_{44} - Liberal Professions	5627	3860	1787	89	89	178	728	2233	18	770	12	661	719	1400	13	82	149
z_{45} - Social Services	8053	2848	5205	64	68	248	1,144	815	859	1066	55	126	102	260	7	64	308
Position																		
z_{46} - Public Employee	15629	7202	8427	128	188	2,010	1,288	1759	563	1338	100	261	524	1099	83	166	3067
z_{47} - Employer or Own Account	6201	3801	2400	48	48	948	981	1983	122	717	85	610	601	1278	24	148	219
z_{48} - Private Employee	14362	3976	10386	888	848	888	1,600	2077	552	301	132	128	1062	844	38	342	577
Migration																		
z_{49} - No Migration	17649	6582	11267	807	884	1,788	1,887	2353	588	991	104	436	821	1385	41	225	1831
z_{50} - From Rural	1005	363	642	18	18	188	184	105	38	58	18	36	32	63	3	17	96
z_{51} - From Urban	17321	8124	9197	188	187	1,988	1,941	3313	597	1296	192	528	1319	1782	100	408	1909
Environment																		
z_{52} - Urban	35090	14535	20555	880	687	8,887	8,881	5737	1208	2311	297	968	2155	3180	137	646	3635
z_{53} - Suburban	1088	444	640	14	18	228	84	85	31	45	20	28	31	46	9	6	228
z_{54} - Rural	79	19	60	1	1	8	8	7	0	2	0	3	5	1	0	2	5

TABLE 58

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	405	Intercept	2.95404				18,803						
z_2 - 2 years	446	0.01230	-0.4078	-0.00113	0.04196	-0.02691	18,782						
z_3 - 3 years	3776	0.10416	0.14951	0.78317	0.01554	50.38559	41,150						
z_4 - 4 years	3683	0.10159	0.04497	0.48610	0.01571	30.94954	30,574						
z_5 - 5 years	5829	0.16079	0.31047	1.04835	0.01304	80.41518	53,645						
z_6 - 6 years	2573	0.06546	0.13522	0.85460	0.01902	44.92057	44,197						
Age													
z_7 - 19 years midpoint	319												
z_8 - 22 " "	4285												
z_9 - 27 " "	6950												
z_{10} - 32 " "	6339												
z_{11} - 39 " "	9168												
z_{12} - 49 " "	5880												
z_{13} - 59 " "	2798												
z_{14} - 68 " "	916												
Course Completed													
z_{15} - Secondary	21255							Intercept	2.95396				18,840
z_{16} - Philosophy	1240							0.05820	-0.01196	0.29148	0.02528	11.53187	25,215
z_{17} - Medicine	2358							0.06504	0.13595	0.85709	0.01878	45.63856	44,392
z_{18} - Pharmacy	317							0.00874	-0.00481	0.30550	0.04895	6.19970	25,520
z_{19} - Dentistry	999							0.02756	0.01029	0.41326	0.02801	14.75538	28,481
z_{20} - Engineering	2191							0.06044	0.22729	1.22905	0.01941	63.30795	64,393
z_{21} - Law	3227							0.08901	0.19721	0.96990	0.01635	59.33340	49,693
z_{22} - Agronomy	146							0.00403	0.03029	0.66524	0.07184	9.25949	36,642
z_{23} - Econ./Pol. Science	654							0.01804	0.07896	0.92256	0.03435	26.86072	47,395
z_{24} - All other courses completed except Seminary	3866							0.10664	0.18618	0.87991	0.01513	58.16807	45,416
Sex													
z_{25} - Female	8729												
z_{26} - Male	27524												

Head of Family			
z_{27} - Not Head	13697		
z_{28} - Head	22586		
Religion			
z_{29} - Protestant	1490		
z_{30} - Jewish	1048		
z_{31} - Other	3896		
z_{32} - Roman Catholic	29879		
Race			
z_{33} - Black	889		
z_{34} - White	34617		
z_{35} - Other	1385		
Children			
z_{36} - Has Children	20999		
z_{37} - No Children	15884		
Class of Activity			
z_{38} - Agriculture	91		
z_{39} - Extractive	115		
z_{40} - Mfg. Industry	4136		
z_{41} - Commerce and Transportation	8212		
z_{42} - Service Industries	1089		
z_{43} - Government or Other	8930		
z_{44} - Liberal Professions	5627		
z_{45} - Social Services	8053		
Position			
z_{46} - Public Employee	15429		
z_{47} - Employer or Own Account	6201		
z_{48} - Private Employee	14362		
Migration			
z_{49} - No Migration	17649		
z_{50} - From Rural	1085		
z_{51} - From Urban	17321		
Environment			
z_{52} - Urban	35090		
z_{53} - Suburban	1084		
z_{54} - Rural	79		
Analysis of Variance			
"F" Value		1795.82814	1168.17213
$R^2(R^2)$		0.19498 (.19490)	0.21580 (.21563)
Std. Error of Estimate		0.87690	0.86513

TABLE 58

STATE OF OKAHARARA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 3						Regression nº4					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	405												
z_2 - 2 years	446												
z_3 - 3 years	3776												
z_4 - 4 years	3685												
z_5 - 5 years	5829												
z_6 - 6 years	2573												
Age													
z_7 - 19 years midpoint	319												
z_8 - 22 " "	4283												
z_9 - 27 " "	6750												
z_{10} - 32 " "	6339												
z_{11} - 39 " "	9168												
z_{12} - 49 " "	5880												
z_{13} - 59 " "	2798												
z_{14} - 68 " "	916												
Course Completed													
z_{15} - Secondary	21255												
z_{16} - Philosophy	1260												
z_{17} - Medicine	2998												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	146												
z_{23} - Econ./Pol. Science	654												
z_{24} - All other courses completed except Seminary	3866												
Sex													
z_{25} - Female	8729	0.26078	-0.35770	-0.81725	0.01121	-72.93065	14,426						32,664
z_{26} - Male	27524	Intercept	3.40626										

Head of Family			
z_{27} - Not Head	13697		0.37754 -0.42990 -0.86629 0.00936 -90.05752 15,482
z_{28} - Head	22566		Intercept 3.61895 37,189
Religion			
z_{29} - Protestant	1480		
z_{30} - Jewish	1048		
z_{31} - Other	3836		
z_{32} - Roman Catholic	29879		
Race			
z_{33} - Black	880		
z_{34} - White	36617		
z_{35} - Other	1305		
Children			
z_{36} - Has Children	20799		
z_{37} - No Children	15804		
Class of Activity			
z_{38} - Agriculture	91		
z_{39} - Extractive	115		
z_{40} - Mfg. Industry	4136		
z_{41} - Commerce and Transportation	8212		
z_{42} - Service Industries	1089		
z_{43} - Government or Other	8930		
z_{44} - Liberal Professions	9427		
z_{45} - Social Services	8053		
Position			
z_{46} - Public Employee	15429		
z_{47} - Employer or Own Account	6201		
z_{48} - Private Employee	11962		
Migration			
z_{49} - No Migration	17649		
z_{50} - From Rural	1005		
z_{51} - From Urban	17321		
Environment			
z_{52} - Urban	33090		
z_{53} - Suburban	1084		
z_{54} - Rural	79		
Analysis of Variance			
"F" Value		5318.88000	8218.78455
$R^2(\bar{R}^2)$		0.12795 (.12795)	0.18681 (.18481)
Std. Error of Estimate		0.91221	0.88196

TABLE 58

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 5						Regression nº 6					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log. Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log. Inc.
Years of University Completed													
z_1 - 1 year	405												
z_2 - 2 years	446												
z_3 - 3 years	3776												
z_4 - 4 years	3683												
z_5 - 5 years	9829												
z_6 - 6 years	2373												
Age													
z_7 - 19 years midpoint	319												
z_8 - 22 " "	4283												
z_9 - 27 " "	6930												
z_{10} - 32 " "	6339												
z_{11} - 39 " "	9168												
z_{12} - 49 " "	5880												
z_{13} - 59 " "	2798												
z_{14} - 68 " "	916												
Course Completed													
z_{15} - Secondary	21295												
z_{16} - Philosophy	1260												
z_{17} - Medicine	2958												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	186												
z_{23} - Econ./Pol. Science	654												
z_{24} - All other courses completed except Secondary	3866												
Sex													
z_{25} - Female	8729												
z_{26} - Male	27524												

Head of Family								
z_{27} - Not Head	13887							
z_{28} - Head	22566							
Religion								
z_{29} - Protestant	1490	0.04110	0.06471	0.33415	0.02585	12.98895	36,409	
z_{30} - Jewish	1048	0.02891	0.04223	0.26791	0.03060	8.75952	34,075	
z_{31} - Other	3836	0.10581	0.01429	0.06940	0.01670	4.15680	27,980	
z_{32} - Roman Catholic	29879	Intercept	3.26066				26,887	
Race								
z_{33} - Black	280						0.00772	-0.04967
z_{34} - White	34617						Intercept	3.31316
z_{35} - Other	1305						0.03600	-0.10109
Children								
z_{36} - Has Children	20999							
z_{37} - No Children	15954							
Class of Activity								
z_{38} - Agriculture	91							
z_{39} - Extractive	115							
z_{40} - Mfg. Industry	4136							
z_{41} - Commerce and Transportation	8212							
z_{42} - Service Industries	1089							
z_{43} - Government or Other	8930							
z_{44} - Liberal Professions	5627							
z_{45} - Social Services	8053							
Position								
z_{46} - Public Employee	15629							
z_{47} - Employer or Own Account	6201							
z_{48} - Private Employee	14362							
Migration								
z_{49} - No Migration	17649							
z_{50} - From Rural	1005							
z_{51} - From Urban	17521							
Environment								
z_{52} - Urban	33090							
z_{53} - Suburban	1084							
z_{54} - Rural	79							
Analysis of Variance								
"F" Value		80.85452					256.16679	
$R^2(\bar{R}^2)$		0.00665 (.00661)					0.01286 (.01285)	
Std. Error of Estimate		0.97261					0.97055	

TABLE 58

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 7						Regression nº 8					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	405												
z_2 - 2 years	446												
z_3 - 3 years	3776												
z_4 - 4 years	3683												
z_5 - 5 years	5829												
z_6 - 6 years	2575												
Age													
z_7 - 19 years midpoint	319												
z_8 - 22 " "	4283												
z_9 - 27 " "	6990												
z_{10} - 32 " "	6339												
z_{11} - 39 " "	9168												
z_{12} - 49 " "	5080												
z_{13} - 59 " "	2798												
z_{14} - 68 " "	916												
Course Completed													
z_{15} - Secondary	21255												
z_{16} - Philosophy	1840												
z_{17} - Medicine	2958												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	146												
z_{23} - Econ./Pol. Science	654												
z_{24} - All other courses completed except Seminary	3966												
Sex													
z_{25} - Female	8729												
z_{26} - Male	27528												

Head of Family									
x_{27} - Not Head	19887								
x_{28} - Head	22966								
Religion									
x_{29} - Protestant	1450								
x_{30} - Jewish	1048								
x_{31} - Other	3836								
x_{32} - Roman Catholic	29079								
Race									
x_{33} - Black	280								
x_{34} - White	36617								
x_{35} - Other	1389								
Children									
x_{36} - Has Children	20999	0.56268	0.51478	0.61979	0.00982	63.13404	35,182		
x_{37} - No Children	15854	Intercept	2.94078				18,959		
Class of Activity									
x_{38} - Agriculture	91							0.00251	0.03292
x_{39} - Extractive	115							0.00317	0.03062
x_{40} - Mfg. Industry	4136							0.11409	0.07189
x_{41} - Commerce and Transportation	8212							0.22652	-0.03184
x_{42} - Service Industries	1089							0.03004	-0.03191
x_{43} - Government or Other	8930							Intercept	3.42816
x_{44} - Liberal Professions	5627							0.15521	0.12713
x_{45} - Social Services	8053							0.22213	-0.21278
Position									
x_{46} - Public Employee	15629								
x_{47} - Employer or Own Account	6201								
x_{48} - Private Employee	14362								
Migration									
x_{49} - No Migration	17649								
x_{50} - From Rural	1005								
x_{51} - From Urban	17321								
Environment									
x_{52} - Urban	35090								
x_{53} - Suburban	1084								
x_{54} - Rural	79								
Analysis of Variance									
"F" Value		3985.90759						345.41758	
$R^2(\bar{R}^2)$		0.09906 (.09906)						0.06220 (.06205)	
Std. Error of Estimate		0.92719						0.96605	

Head of Family									
x_{27} - Not Head	19887								
x_{28} - Head	22966								
Religion									
x_{29} - Protestant	1450								
x_{30} - Jewish	1048								
x_{31} - Other	3836								
x_{32} - Roman Catholic	29079								
Race									
x_{33} - Black	280								
x_{34} - White	36617								
x_{35} - Other	1389								
Children									
x_{36} - Has Children	20999	0.56268	0.51478	0.61979	0.00982	63.13404	35,182		
x_{37} - No Children	15854	Intercept	2.94078				18,959		
Class of Activity									
x_{38} - Agriculture	91							0.00251	0.03292
x_{39} - Extractive	115							0.00317	0.03062
x_{40} - Mfg. Industry	4136							0.11409	0.07189
x_{41} - Commerce and Transportation	8212							0.22652	-0.03184
x_{42} - Service Industries	1089							0.03004	-0.03191
x_{43} - Government or Other	8930							Intercept	3.42816
x_{44} - Liberal Professions	5627							0.15521	0.12713
x_{45} - Social Services	8053							0.22213	-0.21278
Position									
x_{46} - Public Employee	15629								
x_{47} - Employer or Own Account	6201								
x_{48} - Private Employee	14362								
Migration									
x_{49} - No Migration	17649								
x_{50} - From Rural	1005								
x_{51} - From Urban	17321								
Environment									
x_{52} - Urban	35090								
x_{53} - Suburban	1084								
x_{54} - Rural	79								
Analysis of Variance									
"F" Value		3985.90759						345.41758	
$R^2(\bar{R}^2)$		0.09906 (.09906)						0.06220 (.06205)	
Std. Error of Estimate		0.92719						0.96605	

TABLE 58

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 9						Regression nº 10					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Ins.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Ins.
Years of University Completed													
z_1 - 1 year	605												
z_2 - 2 years	466												
z_3 - 3 years	3776												
z_4 - 4 years	3683												
z_5 - 5 years	5829												
z_6 - 6 years	2573												
Age													
z_7 - 19 years midpoint	319												
z_8 - 22 " "	4283												
z_9 - 27 " "	6990												
z_{10} - 32 " "	6339												
z_{11} - 39 " "	9168												
z_{12} - 49 " "	5880												
z_{13} - 59 " "	2798												
z_{14} - 68 " "	916												
Course Completed													
z_{15} - Secondary	21255												
z_{16} - Philosophy	1280												
z_{17} - Medicine	2958												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	186												
z_{23} - Econ./Pol. Science	654												
z_{24} - All other courses completed except Seminary	3866												
Sex													
z_{25} - Female	8729												
z_{26} - Male	27524												

Head of Family			
z_{27} - Not Head	13697		
z_{28} - Head	22566		
Religion			
z_{29} - Protestant	1488		
z_{30} - Jewish	2068		
z_{31} - Other	3836		
z_{32} - Roman Catholic	29079		
Race			
z_{33} - Black	280		
z_{34} - White	35817		
z_{35} - Other	1305		
Children			
z_{36} - Has Children	20399		
z_{37} - No Children	15854		
Class of Activity			
z_{38} - Agriculture	91		
z_{39} - Extractive	115		
z_{40} - Mfg. Industry	4436		
z_{41} - Commerce and Transportation	6212		
z_{42} - Service Industries	1089		
z_{43} - Government or Other	8930		
z_{44} - Liberal Professions	5627		
z_{45} - Social Services	8053		
Position			
z_{46} - Public Employee	15629	Intercept 3.20964	24,770
z_{47} - Employer or Own Account	6201	0.17105 0.23300 0.58090 0.01425 40.77665	44,280
z_{48} - Private Employee	14362	0.39616 -0.10705 -0.06925 0.01097 -4.49037	23,580
Migration			
z_{49} - No Migration	17649		0.48683 -0.13302 -0.27611 0.01030 -26.80330 25,478
z_{50} - From Rural	1095		0.02772 -0.02696 -0.29865 0.05136 -9.52276 22,955
z_{51} - From Urban	17321		Intercept 3.43218 30,984
Environment			
z_{52} - Urban	35090		
z_{53} - Suburban	1084		
z_{54} - Rural	79		
Analysis of Variance			
"F" Value		1051.10452	372.05234
$R^2(\bar{R}^2)$		0.05481 (.05480)	0.02015 (.02014)
Std. Error of Estimate		0.94970	0.96696

TABLE 58

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 11						Regression nº 12					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	405							Intercept	3.19411				24,388
z_2 - 2 years	446							0.01230	-0.04074	0.07108	0.03905	1.82010	26,185
z_3 - 3 years	3776							0.10416	0.14931	0.65050	0.01457	44.64674	46,780
z_4 - 4 years	3683							0.10159	0.04497	0.32194	0.01479	21.76975	33,651
z_5 - 5 years	5829							0.16079	0.31047	0.82516	0.01251	65.96477	55,660
z_6 - 6 years	2573							0.06346	0.13522	0.60648	0.01802	33.76138	44,817
Age													
z_7 - 19 years midpoint	319							0.00880	-0.11623	-1.10984	0.04665	-23.79074	8,039
z_8 - 22 " "	4283							0.11814	-0.29672	-0.78711	0.01544	-50.98316	11,101
z_9 - 27 " "	6930							0.18067	-0.18146	-0.48678	0.01328	-36.65661	14,989
z_{10} - 32 " "	6339							0.17495	-0.08525	-0.22116	0.01334	-16.58197	19,549
z_{11} - 39 " "	9168							Intercept	3.19411				24,388
z_{12} - 49 " "	5880							0.16219	0.20682	0.18939	0.01366	13.86316	29,474
z_{13} - 59 " "	2798							0.07718	0.15555	0.25722	0.01764	13.44438	30,918
z_{14} - 68 " "	916							0.02527	0.07030	0.07481	0.02833	2.64021	26,283
Course Completed													
z_{15} - Secondary	21295												
z_{16} - Philosophy	1240												
z_{17} - Medicine	2958												
z_{18} - Pharmacy	517												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	146												
z_{23} - Econ./Pol. Science	654												
z_{24} - All other courses completed except Seminary	3866												
Sex													
z_{25} - Female	8729												
z_{26} - Male	27528												

Head of Family			
z_{27} - Not Head	13697		
z_{28} - Head	88566		
Religion			
z_{29} - Protestant	1490		
z_{30} - Jewish	1068		
z_{31} - Other	9896		
z_{32} - Roman Catholic	89979		
Race			
z_{33} - Black	280		
z_{34} - White	98617		
z_{35} - Other	1305		
Children			
z_{36} - Has Children	80399		
z_{37} - No Children	19804		
Class of Activity			
z_{38} - Agriculture	91		
z_{39} - Extractive	115		
z_{40} - Mfg. Industry	4136		
z_{41} - Commerce and Transportation	8212		
z_{42} - Service Industries	1089		
z_{43} - Government or Other	8930		
z_{44} - Liberal Professions	5627		
z_{45} - Social Services	8053		
Position			
z_{46} - Public Employee	15629		
z_{47} - Employer or Own Account	6801		
z_{48} - Private Employee	14362		
Migration			
z_{49} - No Migration	17649		
z_{50} - From Rural	1095		
z_{51} - From Urban	17321		
Environment			
z_{52} - Urban	35090	0.96792 0.04554 0.54304 0.10990 4.96112	27,047
z_{53} - Suburban	1084	0.02990 -0.04011 0.31182 0.11371 2.78226	21,464
z_{54} - Rural	79	Intercept 2.75454	15,714
Analysis of Variance			
"F" Value		41.43062	1318.18990
$R^2(R^2)$		0.00228 (.00227)	0.30585 (.30365)
Std. Error of Estimate		0.97574	0.81515

TABLE 58

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 13						Regression nº 14					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	405												
z_2 - 2 years	446												
z_3 - 3 years	3776												
z_4 - 4 years	3685												
z_5 - 5 years	5829												
z_6 - 6 years	2373												
Age													
z_7 - 19 years midpoint	319	0.00880	-0.11623	-1.10880	0.04611	-24.04613	8,022	0.00880	-0.11623	-1.33749	0.04881	-27.40314	9,509
z_8 - 22 " "	4283	0.11814	-0.29672	-0.76838	0.01529	-50.23734	11,276	0.11814	-0.29672	-0.95891	0.01593	-60.19849	13,885
z_9 - 27 " "	6990	0.18067	-0.18146	-0.47496	0.01315	-36.12395	15,120	0.18067	-0.18146	-0.57748	0.01389	-41.58121	20,332
z_{10} - 32 " "	6339	0.17485	-0.02525	-0.21135	0.01320	-16.01158	19,681	0.17485	-0.02525	-0.27316	0.01400	-19.51355	27,565
z_{11} - 39 " "	9168	Intercept	3.19101				24,313	Intercept	3.58969				36,225
z_{12} - 49 " "	5880	0.16219	0.20682	0.18813	0.01352	13.92024	29,316	0.16219	0.20682	0.22601	0.01431	15.79468	45,409
z_{13} - 59 " "	2798	0.07718	0.15555	0.23164	0.01747	13.26034	30,651	0.07718	0.15555	0.27623	0.01851	14.92178	47,787
z_{14} - 68 " "	916	0.02527	0.07030	0.08468	0.02805	3.01894	26,462	0.02527	0.07030	0.15423	0.02974	5.18618	42,263
Course Completed													
z_{15} - Secondary	21255	Intercept	3.19101				24,313						
z_{16} - Philosophy	1240	0.03420	-0.01196	0.18381	0.02362	7.78351	29,219						
z_{17} - Medicine	2958	0.06504	0.13595	0.61395	0.01783	34.43310	44,923						
z_{18} - Pharmacy	317	0.00874	-0.00481	0.08124	0.04575	1.77594	26,371						
z_{19} - Dentistry	999	0.02756	0.01029	0.20459	0.02626	7.79037	29,833						
z_{20} - Engineering	2191	0.06044	0.22729	1.00790	0.01836	54.90664	66,614						
z_{21} - Law	3227	0.08901	0.19721	0.73586	0.01558	47.23431	50,768						
z_{22} - Agronomy	146	0.00403	0.02029	0.36777	0.06708	5.48255	35,120						
z_{23} - Econ./Pol. Science	654	0.01804	0.07896	0.73875	0.03211	23.00332	50,895						
z_{24} - All other courses completed except Seminary	3866	0.10664	0.18618	0.72632	0.01425	50.97391	50,266						
Sex													
z_{25} - Female	8729												
z_{26} - Male	27524												

Head of Family							
x_{27} - Not Head	13687						
x_{28} - Head	22566						
Religion							
x_{29} - Protestant	1490						
x_{30} - Jewish	1068						
x_{31} - Other	3836						
x_{32} - Roman Catholic	29979						
Race							
x_{33} - Black	280						
x_{34} - White	34617						
x_{35} - Other	1305						
Children							
x_{36} - Has Children	20999						
x_{37} - No Children	15094						
Class of Activity							
x_{38} - Agriculture	91		0.00251	0.03292	0.34789	0.09026	3.854358	51,895
x_{39} - Extractive	115		0.00317	0.03062	0.43339	0.08035	5.39611	55,873
x_{40} - Mfg. Industry	4136		0.11409	0.07189	0.11186	0.01613	6.93681	40,510
x_{41} - Commerce and Transportation	8212		0.22652	-0.03184	-0.09767	0.01314	-7.43099	32,852
x_{42} - Service Industries	1089		0.03004	-0.03191	-0.27357	0.02769	-9.94556	27,999
x_{43} - Government or Other	8950		Intercept	3.58969				36,225
x_{44} - Liberal Professions	5627		0.15521	0.12713	0.11983	0.01460	8.20513	40,895
x_{45} - Social Services	8053		0.22213	-0.21278	-0.39705	0.01324	-29.99309	28,353
Position							
x_{46} - Public Employee	15629						
x_{47} - Employer or Own Account	6801						
x_{48} - Private Employee	14362						
Migration							
x_{49} - No Migration	17649						
x_{50} - From Rural	1005						
x_{51} - From Urban	17321						
Environment							
x_{52} - Urban	35090						
x_{53} - Suburban	1084						
x_{54} - Rural	79						
Analysis of Variance							
"F" Value		1063.20091			783.54198		
$R^2(\bar{R}^2)$		0.31947 (.31920)			0.23237 (.23211)		
Std. Error of Estimate		0.80600			0.85601		

TABLE 58

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 15						Regression nº					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	405	Intercept 3.38632					29,557						
z_2 - 2 years	446	0.01230	-0.04074	-0.01910	0.03642	-0.52438	28,998						
z_3 - 3 years	3776	0.10416	0.14951	0.14772	0.02908	5.07982	34,262						
z_4 - 4 years	3683	0.10159	0.04697	-0.01382	0.03291	-0.41979	29,151						
z_5 - 5 years	5829	0.16079	0.31047	-0.05639	0.04627	-1.21857	27,936						
z_6 - 6 years	2573	0.06546	0.13522	-0.54659	0.19659	-2.75295	17,111						
Age													
z_7 - 19 years midpoint	319	0.00880	-0.11623	-0.72955	0.04412	-16.53476	14,250						
z_8 - 22 " "	4283	0.11814	-0.29672	-0.47815	0.01609	-29.71699	18,323						
z_9 - 27 " "	6950	0.18067	-0.18146	-0.31469	0.01312	-23.98077	21,577						
z_{10} - 32 " "	6339	0.17485	0.02525	-0.16454	0.01253	-13.12739	25,073						
z_{11} - 39 " "	9168	Intercept 3.38632					29,557						
z_{12} - 49 " "	5880	0.16219	0.20682	0.12656	0.01279	9.89658	33,545						
z_{13} - 59 " "	2798	0.07718	0.15555	0.12862	0.01660	7.75026	33,614						
z_{14} - 68 " "	916	0.02527	0.07030	-0.02632	0.02654	-0.99177	28,789						
Course Completed													
z_{15} - Secondary	21255	Intercept 3.38632					29,557						
z_{16} - Philosophy	1240	0.03420	-0.01196	0.27873	0.03836	7.26692	39,058						
z_{17} - Medicine	2758	0.06504	0.13595	1.08931	0.19951	5.46538	87,850						
z_{18} - Pharmacy	317	0.00874	-0.00481	-0.02716	0.05188	- 0.52356	28,765						
z_{19} - Dentistry	999	0.02756	0.01029	0.04226	0.03943	1.07178	30,833						
z_{20} - Engineering	2191	0.06044	0.22729	0.86717	0.04877	17.77959	70,351						
z_{21} - Law	3227	0.08901	0.19721	0.64968	0.04809	13.50969	56,600						
z_{22} - Agronomy	186	0.00603	0.02029	0.23538	0.07133	3.29999	37,401						
z_{23} - Econ./Pol. Science	654	0.01804	0.07896	0.59218	0.04411	13.42431	53,437						
z_{24} - All other courses completed except Seminary	3866	0.10664	0.18618	0.52767	0.03030	17.41573	50,098						
Sex													
z_{25} - Female	8729	0.24078	-0.35770	-0.23253	0.01256	-18.49412	25,429						
z_{26} - Male	27528	Intercept 3.38632					29,557						

Head of Family							
x_{27} - Not Head	13687	0.37754	-0.42990	-0.24056	0.01121	-21.43227	25,242
x_{28} - Head	22566	Intercept	3.38632				29,557
Religion							
x_{29} - Protestant	14490	0.04110	0.04472	0.19642	0.02038	9.63964	33,972
x_{30} - Jewish	1048	0.02891	0.04225	0.07563	0.02416	3.12994	31,879
x_{31} - Other	3836	0.10581	0.01429	-0.01323	0.01308	-1.01190	29,169
x_{32} - Roman Catholic	29879	Intercept	3.38632				29,557
Race							
x_{33} - Black	280	0.00772	-0.04967	-0.29830	0.04560	- 6.54092	21,954
x_{34} - White	34617	Intercept	3.38632				29,557
x_{35} - Other	1305	0.03600	-0.10109	-0.26800	0.02154	-12.44008	22,608
Children							
x_{36} - Has Children	20399	Intercept	3.38632				29,557
x_{37} - No Children	15854	0.43732	-0.31474	-0.16156	0.00939	-17.20979	25,148
Class of Activity							
x_{38} - Agriculture	91	0.00251	0.03292	0.26048	0.08224	3.16733	38,392
x_{39} - Extractive	115	0.00317	0.03062	0.20029	0.07243	5.52695	44,107
x_{40} - Mfg. Industry	4136	0.11409	0.07189	0.12551	0.01902	6.59958	33,530
x_{41} - Commerce and Transportation	8212	0.22652	-0.05184	0.03272	0.01644	1.98993	30,580
x_{42} - Service Industries	1089	0.03004	-0.05191	-0.13624	0.02736	-4.97872	25,795
x_{43} - Government or Other	8930	Intercept	3.38632				29,557
x_{44} - Liberal Professions	5627	0.15521	0.12713	-0.09450	0.01952	-4.84143	26,892
x_{45} - Social Services	8053	0.22213	-0.21278	-0.08434	0.01377	-6.12363	27,166
Position							
x_{46} - Public Employee	15629	Intercept	3.38632				29,557
x_{47} - Employer or Own Account	6201	0.17105	0.25300	0.29917	0.01737	17.22476	39,865
x_{48} - Private Employee	14362	0.39616	-0.10705	0.00654	0.01369	0.47776	29,751
Migration							
x_{49} - No Migration	17649	0.48683	-0.13302	-0.03200	0.00841	-3.80416	28,626
x_{50} - From Rural	1005	0.02772	-0.02696	-0.13876	0.02477	- 5.60103	25,727
x_{51} - From Urban	17321	Intercept	3.38632				29,557
Environment							
x_{52} - Urban	35090	Intercept	3.38632				29,557
x_{53} - Suburban	1084	0.02990	-0.04011	-0.18188	0.02371	-7.67013	24,462
x_{54} - Rural	79	0.00218	-0.02559	-0.49030	0.08605	-5.69770	18,102
Analysis of Variance							
"F" Value				568.67400			
$R^2(\bar{R}^2)$				0.39764	(.39676)		
Std. Error of Estimate				0.75869			

are university graduates. In general, the $\bar{R}^2$ values in all regressions are somewhat lower than the other states, however, the relatively large sub-sample populations tend to increase the statistical significance of almost every variable used. The same anomaly between the earnings of three- and four-year university graduates exists as in the North Region and probably for similar reasons. A large portion of the four-year graduates enter Dentistry, Pharmacy, and teaching (Philosophy) which are the three most poorly paid professions studied. The six-year graduates are almost all doctors (2358 out of 2378 six-year graduates) who earn less than the five-year graduates (mostly engineers and lawyers). The maximum explained variance is forty percent when a regression on log income is performed using all classes of variables together.

All University Graduates.--Table 59 contains the results of the regressions using the sample of All University Graduates. Each class of variables is regressed on log income separately. Then groups consisting of Age and Years Completed, Age and Course Completed, and Age and Class of Activity are regressed. Finally, all variables are used in a single regression. The sum of the $\bar{R}^2$ values for each class of variables computed separately totals .513 while the regression of all variables together produces an $\bar{R}^2$ of only .230. The considerable interaction thus demonstrated undoubtedly results from the classes of Sex and Head of Family, Years Completed and Course Completed, and Children and Head

TABLE 59

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.	Regression nº 2 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	1							Intercept 3.80349					44,858
z_2 - 2 years	13							Intercept 3.80349					44,858
z_3 - 3 years	3329							Intercept 3.80349					44,858
z_4 - 4 years	3461							0.23076	-0.19512	-0.35975	0.02299	-15.64674	31,304
z_5 - 5 years	5779							0.38532	0.14139	0.18797	0.02059	9.13082	54,134
z_6 - 6 years	2373							0.15822	-0.00084	-0.01481	0.02547	- 0.58156	44,198
Age													
z_7 - 19 years midpoint	1	Intercept 3.87656					48,258						
z_8 - 22 " "	511	0.03407	-0.12433	-0.73045	0.04344	-16.81660	23,245						
z_9 - 27 " "	2018	0.13455	-0.20633	-0.59543	0.02497	-23.84961	26,606						
z_{10} - 32 " "	2524	0.16829	-0.08745	-0.27526	0.02318	-11.87395	36,646						
z_{11} - 39 " "	4436	Intercept 3.87656					48,258						
z_{12} - 49 " "	3275	0.21836	0.14534	0.18169	0.02142	8.48216	57,873						
z_{13} - 59 " "	1619	0.10795	0.10776	0.21539	0.02700	7.98535	59,868						
z_{14} - 68 " "	614	0.04094	0.03060	0.05819	0.04004	1.45338	51,149						
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	1240												
z_{17} - Medicine	2358												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	146												
z_{23} - Econ./Pol. Science	654												
z_{24} - All other courses completed except Seminary	3866												
Sex													
z_{25} - Female	1602												
z_{26} - Male	13396												

		Head of Family	
x_{27} - Not Head	3369		
x_{28} - Head	11489		
		Religion	
x_{29} - Protestant	648		
x_{30} - Jewish	537		
x_{31} - Other	1726		
x_{32} - Roman Catholic	12097		
		Race	
x_{33} - Black	87		
x_{34} - White	14698		
x_{35} - Other	307		
		Children	
x_{36} - Has Children	9937		
x_{37} - No Children	5043		
		Class of Activity	
x_{38} - Agriculture	45		
x_{39} - Extractive	89		
x_{40} - Mfg. Industry	1901		
x_{41} - Commerce and Transportation	1292		
x_{42} - Service Industries	177		
x_{43} - Government or Other	4966		
x_{44} - Liberal Professions	3849		
x_{45} - Social Services	2825		
		Position	
x_{46} - Public Employee	7202		
x_{47} - Employer or Own Account	3801		
x_{48} - Private Employee	3976		
		Migration	
x_{49} - No Migration	4382		
x_{50} - From Rural	140		
x_{51} - From Urban	8124		
		Environment	
x_{52} - Urban	14535		
x_{53} - Suburban	444		
x_{54} - Rural	19		
		Analysis of Variance	
"F" Value		241.71200	239.59405
$R^2(R^2)$		0.08821 (.08791)	0.08774 (.04562)
Std. Error of Estimate		0.92980	0.95111

TABLE 59

STATE OF OKAHARARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 3						Regression nº 4					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	1												
x_2 - 2 years	13												
x_3 - 3 years	1329												
x_4 - 4 years	3401												
x_5 - 5 years	3779												
x_6 - 6 years	2375												
Age													
x_7 - 19 years midpoint	1												
x_8 - 22 " "	511												
x_9 - 27 " "	2018												
x_{10} - 32 " "	2524												
x_{11} - 39 " "	1436												
x_{12} - 49 " "	1275												
x_{13} - 59 " "	1419												
x_{14} - 68 " "	614												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	1280	Intercept	3.22751				25,217						
x_{17} - Medicine	2358	0.15722	0.00112	0.56559	0.03288	17.19996	44,394						
x_{18} - Pharmacy	317	0.02114	-0.08317	0.01205	0.05899	0.20419	25,522						
x_{19} - Dentistry	999	0.06661	-0.12108	0.12178	0.03985	3.05958	28,483						
x_{20} - Engineering	2191	0.14609	0.15908	0.93747	0.03131	28.14290	64,391						
x_{21} - Law	1227	0.21516	0.06201	0.67835	0.03132	21.65889	49,693						
x_{22} - Agronomy	146	0.00973	-0.01928	0.37378	0.08201	4.55747	36,646						
x_{23} - Econ./Pol. Science	658	0.04361	0.01492	0.63108	0.04530	13.93121	47,399						
x_{24} - All other courses completed except Seminary	3866	0.25777	0.01580	0.98850	0.03059	19.23656	45,423						
Sex													
x_{25} - Female	1602							0.10681	-0.29360	-0.92539	0.02460	-37.61175	19,376
x_{26} - Male	13396							Intercept	3.88940				48,882

Head of Family			
z_{27} - Not Head	3309		
z_{28} - Head	11689		
Religion			
z_{29} - Protestant	648		
z_{30} - Jewish	537		
z_{31} - Other	1756		
z_{32} - Roman Catholic	12877		
Race			
z_{33} - Black	67		
z_{34} - White	14648		
z_{35} - Other	349		
Children			
z_{36} - Has Children	9337		
z_{37} - No Children	5081		
Class of Activity			
z_{38} - Agriculture	45		
z_{39} - Extractive	49		
z_{40} - Mfg. Industry	1981		
z_{41} - Commerce and Transportation	1972		
z_{42} - Service Industries	177		
z_{43} - Government or Other	4966		
z_{44} - Liberal Professions	3849		
z_{45} - Social Services	2868		
Position			
z_{46} - Public Employee	7202		
z_{47} - Employer or Own Account	3801		
z_{48} - Private Employee	3976		
Migration			
z_{49} - No Migration	6382		
z_{50} - From Rural	348		
z_{51} - From Urban	8124		
Environment			
z_{52} - Urban	14535		
z_{53} - Suburban	444		
z_{54} - Rural	19		
Analysis of Variance			
"F" Value		148.62270	1414.6351
R^2 ($\bar{R}^2$)		0.07390 (.07301)	0.08620 (.08620)
Std. Error of Estimate		0.93733	0.93087

TABLE 59

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 5						Regression nº 6					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Ins.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Ins.
Years of University Completed													
z_1 - 1 year	1												
z_2 - 2 years	13												
z_3 - 3 years	1329												
z_4 - 4 years	1461												
z_5 - 5 years	5779												
z_6 - 6 years	2373												
Age													
z_7 - 19 years midpoint	1												
z_8 - 22 " "	511												
z_9 - 27 " "	2018												
z_{10} - 32 " "	2524												
z_{11} - 39 " "	1436												
z_{12} - 49 " "	1275												
z_{13} - 59 " "	1019												
z_{14} - 68 " "	614												
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	1240												
z_{17} - Medicine	2358												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	146												
z_{23} - Econ./Pol. Science	694												
z_{24} - All other courses completed except Seminary	3866												
Sex													
z_{25} - Female	1602												
z_{26} - Male	13396												

Head of Family				
x_{29} - Not Head	3309	0.22063 -0.30629 -0.71909 0.01825 -39.40168	25,283	
x_{28} - Head	11689	Intercept 3.96981	71,894	
Religion				
x_{29} - Protestant	668		0.04454 0.09980 0.27918 0.03843 7.83469	57,987
x_{30} - Jewish	537		0.03580 -0.00836 -0.02232 0.04284 -0.52079	42,280
x_{31} - Other	1736		0.11575 -0.00951 -0.01578 0.02495 -0.43234	43,162
x_{32} - Roman Catholic	12097		Intercept 3.70074	43,898
Race				
x_{33} - Black	67			
x_{34} - White	14604			
x_{35} - Other	307			
Children				
x_{36} - Has Children	9937			
x_{37} - No Children	5041			
Class of Activity				
x_{38} - Agriculture	45			
x_{39} - Extractive	49			
x_{40} - Mfg. Industry	1501			
x_{41} - Commerce and Transportation	1572			
x_{42} - Service Industries	177			
x_{43} - Government or Other	4966			
x_{44} - Liberal Professions	3840			
x_{45} - Social Services	2848			
Position				
x_{46} - Public Employee	7202			
x_{47} - Employer or Own Account	3801			
x_{48} - Private Employee	3976			
Migration				
x_{49} - No Migration	6382			
x_{50} - From Rural	343			
x_{51} - From Urban	8124			
Environment				
x_{52} - Urban	14535			
x_{53} - Suburban	444			
x_{54} - Rural	19			
Analysis of Variance				
"F" Value		1552.49249	18.14882	
$R^2(R^2)$		0.09381 (.09381)	0.00342 (.00350)	
Std. Error of Estimate		0.92693	0.97188	

TABLE 59

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 7						Regression nº 8					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	1												
x_2 - 2 years	13												
x_3 - 3 years	1329												
x_4 - 4 years	3401												
x_5 - 5 years	5779												
x_6 - 6 years	2373												
Age													
x_7 - 19 years midpoint	1												
x_8 - 22 " "	511												
x_9 - 27 " "	2018												
x_{10} - 32 " "	2524												
x_{11} - 39 " "	4436												
x_{12} - 49 " "	3275												
x_{13} - 59 " "	1019												
x_{14} - 68 " "	614												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	1240												
x_{17} - Medicine	2358												
x_{18} - Pharmacy	317												
x_{19} - Dentistry	999												
x_{20} - Engineering	2191												
x_{21} - Law	3227												
x_{22} - Agronomy	146												
x_{23} - Econ./Pol. Science	654												
x_{24} - All other courses completed except Seminary	3866												
Sex													
x_{25} - Female	1602												
x_{26} - Male	13396												

Head of Family			
z_{27} - Not Head	3309		
z_{28} - Head	11489		
Religion			
z_{29} - Protestant	648		
z_{30} - Jewish	537		
z_{31} - Other	1736		
z_{32} - Roman Catholic	12097		
Race			
z_{33} - Black	67	0.00447 -0.03947 -0.58802 0.11889 -4.94600	24,879
z_{34} - White	14604	Intercept 3.88284	44,792
z_{35} - Other	307	0.02047 -0.06250 -0.43254 0.09599 -7.72196	29,078
Children			
z_{36} - Has Children	9537		0.66256 0.22399 0.46117 0.01489 28.14657 51,737
z_{37} - No Children	5081		Intercept 3.49508 32,823
Class of Activity			
z_{38} - Agriculture	45		
z_{39} - Extractive	49		
z_{40} - Mfg. Industry	1981		
z_{41} - Commerce and Transportation	1572		
z_{42} - Service Industries	177		
z_{43} - Government or Other	4966		
z_{44} - Liberal Professions	3840		
z_{45} - Social Services	2868		
Position			
z_{46} - Public Employee	7202		
z_{47} - Employer or Own Account	3801		
z_{48} - Private Employee	3976		
Migration			
z_{49} - No Migration	6382		
z_{50} - From Rural	348		
z_{51} - From Urban	8124		
Environment			
z_{52} - Urban	14535		
z_{53} - Suburban	444		
z_{54} - Rural	19		
Analysis of Variance			
"F" Value		41.67678	792.11572
$R^2(\bar{R}^2)$		0.00553 (.00548)	0.05017 (.05017)
Std. Error of Estimate		0.97091	0.96884

TABLE 59

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 9						Regression nº 10					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	1												
z_2 - 2 years	13												
z_3 - 3 years	3329												
z_4 - 4 years	3461												
z_5 - 5 years	5779												
z_6 - 6 years	2373												
Age													
z_7 - 19 years midpoint	1												
z_8 - 22 " "	511												
z_9 - 27 " "	2018												
z_{10} - 32 " "	2524												
z_{11} - 39 " "	4436												
z_{12} - 49 " "	3275												
z_{13} - 59 " "	1419												
z_{14} - 68 " "	614												
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	1240												
z_{17} - Medicine	2358												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	146												
z_{23} - Econ./Pol. Science	694												
z_{24} - All other courses completed except Seminary	3866												
Sex													
z_{25} - Female	1602												
z_{26} - Male	13396												

Head of Family			
z_{27} - Not Head	1309		
z_{28} - Head	11689		
Religion			
z_{29} - Protestant	68		
z_{30} - Jewish	537		
z_{31} - Other	1736		
z_{32} - Roman Catholic	12857		
Race			
z_{33} - Black	67		
z_{34} - White	14608		
z_{35} - Other	369		
Children			
z_{36} - Has Children	9337		
z_{37} - No Children	5081		
Class of Activity			
z_{38} - Agriculture	45	0.00300 0.02092 0.30666 0.14240 2.15350	64,188
z_{39} - Extractive	49	0.00827 0.08163 0.50731 0.13652 3.71999	78,451
z_{40} - Mfg. Industry	1501	0.10008 0.08206 0.17497 0.02801 6.24642	56,248
z_{41} - Commerce and Transportation	1572	0.10481 0.03884 0.04591 0.02752 1.66806	49,495
z_{42} - Service Industries	177	0.01180 -0.02202 -0.26079 0.07274 -3.58908	36,398
z_{43} - Government or Other	4966	Intercept 3.85316	47,236
z_{44} - Liberal Professions	3840	0.25603 0.04766 0.04449 0.02044 0.70928	47,926
z_{45} - Social Services	2848	0.18989 -0.20393 -0.47465 0.02235 -21.23430	29,386
Position			
z_{46} - Public Employee	7202		Intercept 3.71282 60,989
z_{47} - Employer or Own Account	3881		0.25343 0.11082 0.26291 0.01939 13.56071 53,289
z_{48} - Private Employee	3976		0.26510 -0.02211 0.04190 0.01911 2.19327 42,782
Migration			
z_{49} - No Migration	6382		
z_{50} - From Rural	348		
z_{51} - From Urban	8124		
Environment			
z_{52} - Urban	14535		
z_{53} - Suburban	444		
z_{54} - Rural	19		
Analysis of Variance			
"F" Value		108.94033	95.69781
$R^2(\bar{R}^2)$		0.04629 (.04591)	0.01269 (.01255)
Std. Error of Estimate		0.99096	0.98786

TABLE 59

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 11						Regression nº 12					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log. Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log. Inc.
Years of University Completed													
z_1 - 1 year	1												
z_2 - 2 years	13												
z_3 - 3 years	1329												
z_4 - 4 years	1461												
z_5 - 5 years	3779												
z_6 - 6 years	2373												
Age													
z_7 - 19 years midpoint	1												
z_8 - 22 " "	511												
z_9 - 27 " "	2018												
z_{10} - 32 " "	2524												
z_{11} - 39 " "	4436												
z_{12} - 49 " "	3275												
z_{13} - 59 " "	1619												
z_{14} - 68 " "	614												
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	1240												
z_{17} - Medicine	2358												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	999												
z_{20} - Engineering	2191												
z_{21} - Law	3227												
z_{22} - Agronomy	146												
z_{23} - Econ./Pol. Science	654												
z_{24} - All other courses completed except Seminary	3866												
Sex													
z_{25} - Female	1682												
z_{26} - Male	13996												

Head of Family			
z_{27} - Not Head	3389		
z_{28} - Head	11489		
Religion			
z_{29} - Protestant	688		
z_{30} - Jewish	537		
z_{31} - Other	1736		
z_{32} - Roman Catholic	12877		
Race			
z_{33} - Black	87		
z_{34} - White	14804		
z_{35} - Other	309		
Children			
z_{36} - Has Children	9937		
z_{37} - No Children	5082		
Class of Activity			
z_{38} - Agriculture	45		
z_{39} - Extractive	40		
z_{40} - Mfg. Industry	1501		
z_{41} - Commerce and Transportation	1572		
z_{42} - Service Industries	177		
z_{43} - Government or Other	4966		
z_{44} - Liberal Professions	3840		
z_{45} - Social Services	2868		
Position			
z_{46} - Public Employee	7202		
z_{47} - Employer or Own Account	3881		
z_{48} - Private Employee	3976		
Migration			
z_{49} - No Migration	6382	0.42532 -0.07681 -0.15773 0.01617 -9.75326	40,688
z_{50} - From Rural	363	0.02420 -0.02818 -0.21727 0.05208 -4.75253	37,208
z_{51} - From Urban	8124	Intercept 3.84366	47,639
Environment			
z_{52} - Urban	14535		Intercept 3.79809 44,616
z_{53} - Suburban	444		0.02960 -0.03968 -0.22870 0.04686 -4.88091 35,485
z_{54} - Rural	19		0.00127 -0.02157 -0.59711 0.22328 -2.67628 24,557
Analysis of Variance			
"F" Value		53.55739	15.40488
R^2 ($\bar{R}^2$)		0.00709 (.00704)	0.00205 (.00200)
Std. Error of Estimate		0.97815	0.97881

TABLE 59

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 13						Regression nº 14					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Inc.
Years of University Completed													
x_1 - 1 year	1							Intercept 3.93358					51,089
x_2 - 2 years	13							Intercept 3.93358					51,089
x_3 - 3 years	1329							Intercept 3.93358					51,089
x_4 - 4 years	3461							0.23076	-0.19512	-0.37680	0.02206	-17.07755	35,050
x_5 - 5 years	5779							0.38532	0.16339	0.11955	0.01991	6.00560	57,578
x_6 - 6 years	2373							0.15822	-0.00084	-0.10307	0.02461	-4.18722	46,086
Age													
x_7 - 19 years midpoint	1	Intercept 3.40342					30,067	Intercept 3.93358					51,089
x_8 - 22 " "	511	0.03407	-0.12433	-0.69726	0.04228	-16.49007	14,972	0.03407	-0.12433	-0.70768	0.04281	-16.53119	25,176
x_9 - 27 " "	2018	0.13455	-0.20633	-0.57097	0.02413	-23.65830	16,987	0.13455	-0.20633	-0.57729	0.02445	-23.61459	28,683
x_{10} - 32 " "	2528	0.16829	-0.08745	-0.25840	0.02240	-11.53560	23,220	0.16829	-0.08745	-0.27075	0.02269	-11.93155	38,972
x_{11} - 39 " "	4436	Intercept 3.40342					30,067	Intercept 3.93358					51,089
x_{12} - 49 " "	3275	0.21836	0.14534	0.17883	0.02075	8.61935	35,955	0.21836	0.14534	0.17609	0.02108	8.37243	60,927
x_{13} - 59 " "	1619	0.10795	0.10776	0.19808	0.02614	7.57678	36,653	0.10795	0.10776	0.19838	0.02647	7.49513	62,300
x_{14} - 68 " "	614	0.04094	0.03060	0.06162	0.03876	1.58962	31,978	0.04094	0.03060	0.04047	0.03926	1.03068	53,199
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	1240	Intercept 3.40342					30,067						
x_{17} - Medicine	2358	0.15722	0.00112	0.42755	0.03175	13.46533	46,108						
x_{18} - Pharmacy	317	0.02114	-0.08317	-0.10030	0.05661	-1.77197	27,197						
x_{19} - Dentistry	999	0.06661	-0.12108	0.01795	0.03826	0.46920	30,612						
x_{20} - Engineering	2191	0.14609	0.15908	0.82223	0.03206	25.64951	68,419						
x_{21} - Law	3227	0.21516	0.06201	0.54771	0.03021	18.12920	51,994						
x_{22} - Agronomy	146	0.00973	-0.01988	0.17472	0.07869	2.22025	35,807						
x_{23} - Econ./Pol. Science	658	0.04381	0.04892	0.95297	0.04344	12.72986	52,268						
x_{24} - All other courses completed except Seminary	3866	0.25777	0.01540	0.53604	0.02933	18.27516	51,391						
Sex													
x_{25} - Female	1602												
x_{26} - Male	13396												

Head of Family			
z_{27} - Not Head	3389		
z_{28} - Head	11489		
Religion			
z_{29} - Protestant	648		
z_{30} - Jewish	537		
z_{31} - Other	1736		
z_{32} - Roman Catholic	12057		
Race			
z_{33} - Black	87		
z_{34} - White	14604		
z_{35} - Other	307		
Children			
z_{36} - Has Children	9137		
z_{37} - No Children	5081		
Class of Activity			
z_{38} - Agriculture	45		
z_{39} - Extractive	49		
z_{40} - Mfg. Industry	1501		
z_{41} - Commerce and Transportation	1572		
z_{42} - Service Industries	177		
z_{43} - Government or Other	4966		
z_{44} - Liberal Professions	3840		
z_{45} - Social Services	2848		
Position			
z_{46} - Public Employee	7202		
z_{47} - Employer or Own Account	3801		
z_{48} - Private Employee	3976		
Migration			
z_{49} - No Migration	6382		
z_{50} - From Rural	348		
z_{51} - From Urban	8124		
Environment			
z_{52} - Urban	14535		
z_{53} - Suburban	444		
z_{54} - Rural	19		
Analysis of Variance			
"F" Value		191.97119	241.80175
$R^2(\bar{R}^2)$		0.15209 (.15137)	0.12879 (.12645)
Std. Error of Estimate		0.89487	0.91082

TABLE 59

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 15						Regression nº 16					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	1							Intercept	3.79985				44,694
z_2 - 2 years	13							Intercept	3.79985				44,694
z_3 - 3 years	3329							Intercept	3.79985				44,694
z_4 - 4 years	3461							0.23082	-0.19538	-0.12981	0.03178	-4.08468	39,254
z_5 - 5 years	5779							0.38529	0.16390	-0.16390	0.04954	-3.30852	37,938
z_6 - 6 years	2373							0.19815	-0.00083	-0.49957	0.22291	-2.06171	28,227
Age													
z_7 - 19 years midpoint	1	Intercept	3.94039				51,439	Intercept	3.79985				44,694
z_8 - 22 " "	511	0.03407	-0.12433	-0.70843	0.04261	-16.63184	25,324	0.03407	-0.12414	-0.42918	0.04258	-10.07860	29,098
z_9 - 27 " "	2018	0.13455	-0.20633	-0.57746	0.02485	-23.61982	28,874	0.13454	-0.20579	-0.39092	0.02451	-15.94866	30,233
z_{10} - 32 " "	2524	0.16829	-0.08765	-0.26935	0.02269	-11.86970	39,293	0.16833	-0.08780	-0.19567	0.02161	-9.05633	36,752
z_{11} - 39 " "	4436	Intercept	3.94039				51,439	Intercept	3.79985				44,694
z_{12} - 49 " "	3275	0.21836	0.14534	0.18335	0.02095	8.75238	61,790	0.21835	0.14559	0.12413	0.01991	6.23494	50,602
z_{13} - 59 " "	1619	0.10795	0.10776	0.19539	0.02642	7.39515	62,538	0.10787	0.10763	0.12242	0.02517	4.86385	50,515
z_{14} - 68 " "	614	0.04094	0.03060	0.02745	0.03925	0.69936	52,870	0.04094	0.03067	-0.03111	0.03718	-0.83681	43,325
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	1240							Intercept	3.79985				44,694
z_{17} - Medicine	2358							0.15715	0.00108	0.53428	0.22686	2.35507	76,258
z_{18} - Pharmacy	317							0.02113	-0.08298	-0.34320	0.05598	-6.48805	31,083
z_{19} - Dentistry	999							0.06661	-0.12083	-0.31414	0.04028	-7.79836	32,646
z_{20} - Engineering	2191							0.14608	0.15928	0.46029	0.06296	7.31083	70,820
z_{21} - Law	1227							0.21515	0.06238	0.24660	0.06216	3.96727	57,194
z_{22} - Agronomy	146							0.00973	-0.01921	-0.18218	0.07783	-2.34068	37,251
z_{23} - Econ./Pol. Science	634							0.04307	0.01330	0.20089	0.04434	4.53065	54,439
z_{24} - All other courses completed except Seminary	3866							0.25774	0.01598	0.12936	0.03945	3.27927	50,867
Sex													
z_{25} - Female	1602							0.10681	-0.29304	-0.41723	0.02764	-15.20457	29,448
z_{26} - Male	13396							Intercept	3.79985				44,694

Head of Family									
z_{27} - Not Head	3309						0.22062	-0.30561	-0.22776	0.02163	-10.12076	35,911
z_{28} - Head	11689						Intercept	3.79985				44,694
Religion												
z_{29} - Protestant	648						0.04453	0.05997	0.18178	0.03467	5.84179	53,681
z_{30} - Jewish	537						0.03580	-0.00613	-0.00838	0.03829	- 0.21880	44,382
z_{31} - Other	1736						0.11575	-0.00928	-0.03690	0.02208	-1.67132	43,075
z_{32} - Roman Catholic	12957						Intercept	3.79985				44,694
Race												
z_{33} - Black	87						0.00447	-0.03961	-0.14419	0.10187	-4.42811	28,097
z_{34} - White	14604						Intercept	3.79985				44,694
z_{35} - Other	307						0.02047	-0.06238	-0.31555	0.04953	-6.37067	32,600
Children												
z_{36} - Has Children	9937						0.66252	0.22388	0.17619	0.01646	10.70458	53,366
z_{37} - No Children	5061						Intercept	3.79985				44,694
Class of Activity												
z_{38} - Agriculture	45	0.00300	0.02092	0.18699	0.13625	1.37246	62,015	0.00300	0.02093	0.12924	0.13381	0.96585	50,861
z_{39} - Extractive	49	0.00327	0.03343	0.51328	0.13054	3.93210	85,942	0.00327	0.03343	0.28043	0.12582	2.22879	79,182
z_{40} - Mfg. Industry	1501	0.10008	0.08206	0.18520	0.02684	6.89895	61,904	0.10007	0.08240	0.01161	0.03567	0.32545	45,216
z_{41} - Commerce and Transportation	1572	0.10481	0.03884	0.01692	0.02636	0.64191	52,316	0.10481	0.03911	-0.06792	0.03324	-2.04325	41,760
z_{42} - Service Industries	177	0.01180	-0.02202	-0.27230	0.06957	-3.91424	39,177	0.01180	-0.02177	-0.34945	0.06906	-5.06043	31,513
z_{43} - Government or Other	4966	Intercept	3.96039				51,439	Intercept	3.79985				44,694
z_{44} - Liberal Professions	3840	0.25603	0.04766	0.00022	0.01964	0.01102	51,450	0.25596	0.04777	-0.18784	0.03502	-5.36387	37,040
z_{45} - Social Services	2848	0.18989	-0.20393	-0.44392	0.02141	-20.72949	32,999	0.18988	-0.20341	-0.22395	0.02528	-8.85752	35,727
Position												
z_{46} - Public Employee	7202							Intercept	3.79985			44,694
z_{47} - Employer or Own Account	3801							0.25335	0.11102	0.32404	0.03152	10.27968	61,799
z_{48} - Private Employee	3976							0.26509	-0.02162	0.08815	0.02599	3.39162	48,813
Migration												
z_{49} - No Migration	6382							0.42550	-0.07413	-0.02693	0.01467	-1.83518	43,907
z_{50} - From Rural	343							0.02420	-0.02804	-0.16660	0.04617	-3.60808	37,836
z_{51} - From Urban	8124							Intercept	3.79985				44,694
Environment												
z_{52} - Urban	14535							Intercept	3.79985			44,694
z_{53} - Suburban	444							0.02960	-0.03930	-0.17433	0.04211	-4.14018	37,548
z_{54} - Rural	19							0.00133	-0.03068	-0.87302	0.19353	-4.51117	18,668
Analysis of Variance												
"F" Value		170.23372					118.83182					
$R^2(\bar{R}^2)$		0.12849 (.12800)					0.23187 (.22998)					
Std. Error of Estimate		0.90914					0.85506					

of Family. This probable interaction should be remembered when evaluating the $\bar{R}^2$ values that follow. Class of Activity explains only 4.6 percent of income variance which is in the same low range as the other areas studied. Neither Course Completed nor Years Completed explains large amounts of variance--7.3 and 4.6 percent respectively. Course Completed is more important than Years Completed but the interaction of these two variable classes must be remembered. Age alone explains 8.8 percent of variance; Sex, 8.6 percent with Females representing only eleven percent of the sample; Heads of Family, nine percent; Religion, .4 of one percent with Roman Catholics making up eighty percent of the sample; Race, .5 of one percent with ninety-seven percent of the sample reported as "White"; Children, five percent; Position in Occupation only 1.3 percent; Migration History, .7 of one percent; and Environment, .2 of one percent. The F value for all regressions shows significance well over the ninety-nine percent level.

The geometric means of incomes received by graduates of the curricula studied rank as follows:

1. Engineering
2. Law
3. Economics
4. Other
5. Medicine
6. Agronomy
7. Dentistry
8. Pharmacy
9. Philosophy

The difference between Pharmacy and Philosophy is not significant. Incomes of Females average less than one-half those of Males as do incomes of those who are non-Heads of Family when compared to Heads of Family. Protestants' incomes are

significantly higher than incomes of Jews, Roman Catholics, and "Other Religions," but there are no significant differences between the latter three groups. Whites earn more than mulattoes who in turn earn more than Blacks. Those with children earn more than those without. Income by Class of Activity ranks as follows:

1. Extractive Industry
2. Agriculture
3. Manufacturing Industry
4. Commerce and Transportation
5. Liberal Professions and Government Service
6. Service Industries
7. Social Services

Employers and persons Self-Employed earn more than Private Employees who in turn earn more than Public Employees. Persons having migrated from an urban area have incomes higher than those without a migration history, and migrants from a rural area show significantly lower incomes than either of the other two groups. The ranking of incomes by current environment is Urban, Suburban, and Rural. In Guanabara, however, the rural group consists of only 19 persons.

The age-income profile for All University Graduates, Figure 45, reflects the considerably higher money incomes that prevailed in Guanabara compared to the other areas studied. Detailed comparisons of the profiles between regions are contained in Chapter IV.

All Secondary Graduates.--Table 60 contains the regressions for the sample of All Secondary Graduates. As with the other areas, Age explains more than twice as much income variance as with the university graduates. Amon the employed

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GUANABARA - AGE/INCOME PROFILES - 1960

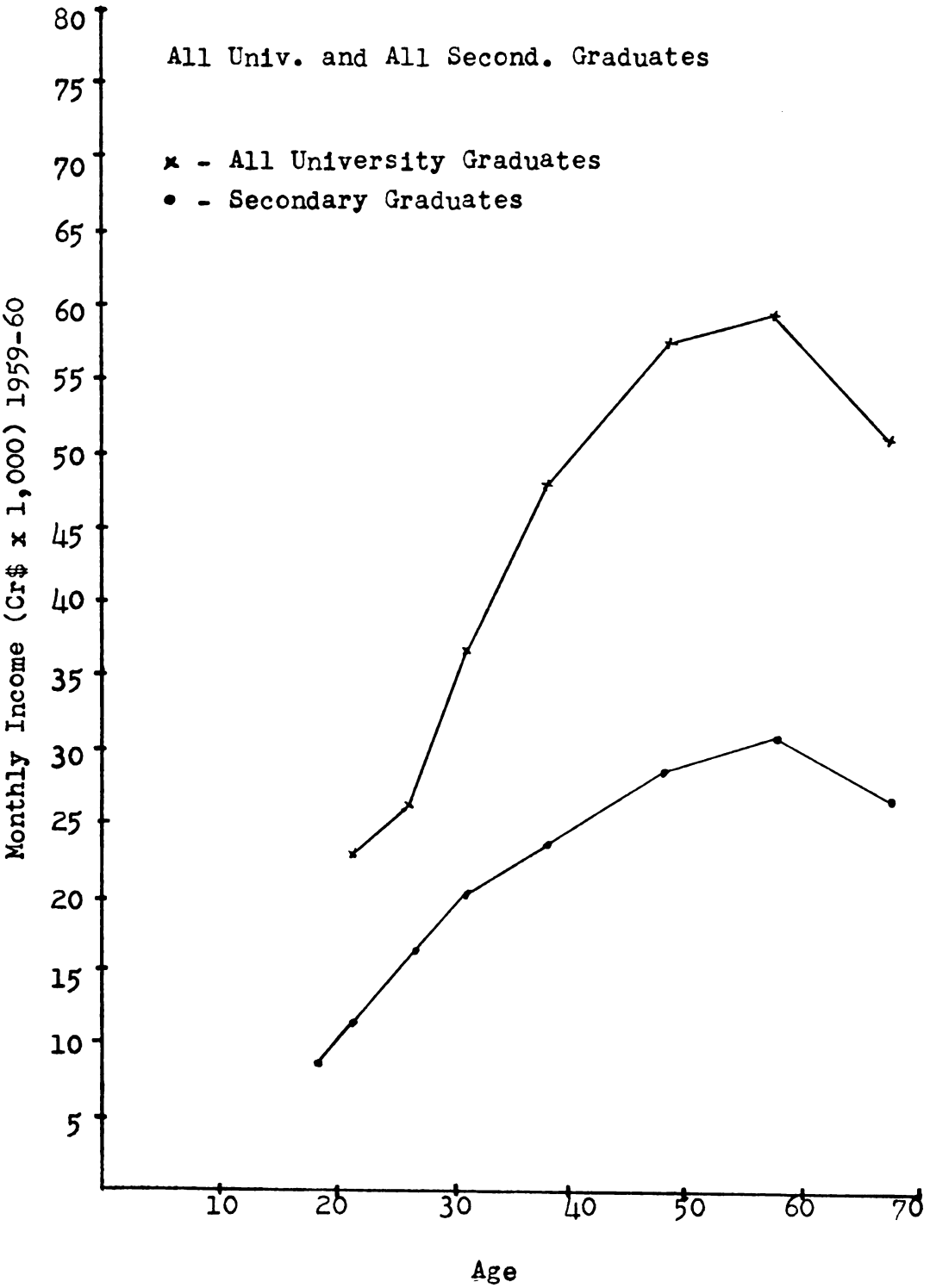


Fig. 45

TABLE 60

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	404												
z_2 - 2 years	433							Intercept 2.95348					18,793
z_3 - 3 years	447							0.02037	-0.00266	-0.01231	0.03936	-0.31286	18,563
z_4 - 4 years	222							0.02103	0.01337	0.07859	0.03875	1.97636	20,289
z_5 - 5 years	50							0.01044	0.01495	0.12859	0.05468	2.20515	21,201
z_6 - 6 years	0							0.00235	0.00054	0.01161	0.11474	0.10116	19,012
Age													
z_7 - 19 years midpoint	318	0.01496	-0.12965	-1.08256	0.04255	-25.44108	8,044						
z_8 - 22 " "	3772	0.17786	-0.30164	-0.75766	0.01603	-47.25503	11,132						
z_9 - 27 " "	4532	0.21322	-0.12090	-0.41959	0.01527	-27.48361	15,610						
z_{10} - 32 " "	3815	0.17949	0.03358	-0.17320	0.01598	-10.83666	19,972						
z_{11} - 39 " "	4732	Intercept 3.16751					23,788						
z_{12} - 49 " "	2605	0.18256	0.19534	0.19220	0.01792	10.72664	28,781						
z_{13} - 59 " "	1179	0.05547	0.14890	0.26656	0.02991	11.14896	31,003						
z_{14} - 68 " "	302	0.01421	0.04973	0.10433	0.04359	2.39323	26,360						
Course Completed													
z_{15} - Secondary	21295												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Fol. Science	0												
z_{24} - All other courses completed	0												
[illegible]	0												
Sex													
z_{25} - Female	7127												
z_{26} - Male	14168												

Head of Family			
z_{27} - Not Head	10578		
z_{28} - Head	10677		
Religion			
z_{29} - Protestant	822		
z_{30} - Jewish	511		
z_{31} - Other	2269		
z_{32} - Roman Catholic	17822		
Race			
z_{33} - Black	213		
z_{34} - White	20813		
z_{35} - Other	998		
Children			
z_{36} - Has Children	10462		
z_{37} - No Children	10799		
Class of Activity			
z_{38} - Agriculture	46		
z_{39} - Extractive	66		
z_{40} - Mfg. Industry	2635		
z_{41} - Commerce and Transportation	6490		
z_{42} - Service Industries	912		
z_{43} - Government or Other	3964		
z_{44} - Liberal Professions	1787		
z_{45} - Social Services	5895		
Position			
z_{46} - Public Employee	8427		
z_{47} - Employer or Own Account	2400		
z_{48} - Private Employee	10586		
Migration			
z_{49} - No Migration	11267		
z_{50} - From Rural	482		
z_{51} - From Urban	9197		
Environment			
z_{52} - Urban	20555		
z_{53} - Suburban	490		
z_{54} - Rural	60		
Analysis of Variance			
"F" Value		660.77096	2.19818
$R^2(\bar{R}^2)$		0.17878 (.17856)	0.00041 (.00028)
Std. Error of Estimate		0.73452	0.81092

TABLE 60

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 3						Regression nº 4					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	404												
z_2 - 2 years	453												
z_3 - 3 years	447												
z_4 - 4 years	222												
z_5 - 5 years	90												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	318												
z_8 - 22 " "	3772												
z_9 - 27 " "	4532												
z_{10} - 32 " "	3815												
z_{11} - 39 " "	4732												
z_{12} - 49 " "	2605												
z_{13} - 59 " "	1179												
z_{14} - 68 " "	302												
Course Completed													
z_{15} - Secondary	21295												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed	0												
[illegible]													
Sex													
z_{25} - Female	7167	0.39531	-0.29212	-0.901165	0.011126	-44.52797	13,502						
z_{26} - Male	14128	Intercept 3.10427					22,295						

Head of Family			
z_{27} - Not Head	10578		0.48826 -0.40827 -0.66191 0.01815 -65.20135 13,489
z_{28} - Head	10877		Intercept 3.25922 25,892
Religion			
z_{29} - Protestant	822		
z_{30} - Jewish	511		
z_{31} - Other	2260		
z_{32} - Roman Catholic	17822		
Race			
z_{33} - Black	213		
z_{34} - White	20013		
z_{35} - Other	930		
Children			
z_{36} - Has Children	10462		
z_{37} - No Children	10793		
Class of Activity			
z_{38} - Agriculture	86		
z_{39} - Extractive	66		
z_{40} - Mfg. Industry	2635		
z_{41} - Commerce and Transportation	6020		
z_{42} - Service Industries	912		
z_{43} - Government or Other	3964		
z_{44} - Liberal Professions	1787		
z_{45} - Social Services	5295		
Position			
z_{46} - Public Employee	8427		
z_{47} - Employer or Own Account	2600		
z_{48} - Private Employee	10986		
Migration			
z_{49} - No Migration	11267		
z_{50} - From Rural	642		
z_{51} - From Urban	9197		
Environment			
z_{52} - Urban	20955		
z_{53} - Suburban	640		
z_{54} - Rural	60		
Analysis of Variance			
"F" Value		1982.73979	4251.21425
R^2 ($\bar{R}^2$)		0.08533 (.08533)	0.16668 (.16668)
Std. Error of Estimate		0.77508	0.73980

TABLE 60

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 5						Regression nº 6					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	464												
x_2 - 2 years	433												
x_3 - 3 years	447												
x_4 - 4 years	222												
x_5 - 5 years	50												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	518												
x_8 - 22 " "	3772												
x_9 - 27 " "	4532												
x_{10} - 32 " "	3815												
x_{11} - 37 " "	4732												
x_{12} - 49 " "	2605												
x_{13} - 59 " "	1179												
x_{14} - 68 " "	302												
Course Completed													
x_{15} - Secondary	21255												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Fol. Science	0												
x_{24} - All other courses completed except Engineer	0												
Sex													
x_{25} - Female	7167												
x_{26} - Male	14128												

Head of Family			
x_{27} - Not Head	10578		
x_{28} - Head	10877		
Religion			
x_{29} - Protestant	822	0.03867 0.06953 0.30806 0.02876 10.70970 28.995	
x_{30} - Jewish	511	0.02404 0.06793 0.37789 0.03618 10.44637 26,788	
x_{31} - Other	2100	0.09880 0.01419 0.06184 0.01860 3.32399 19,509	
x_{32} - Roman Catholic	17822	Intercept 2.90902	18,359
Race			
x_{33} - Black	213		0.01002 -0.04291 -0.36619 0.09553 -6.99689 13,397
x_{34} - White	20013		Intercept 2.95670 19,434
x_{35} - Other	998		0.04695 -0.09295 -0.35992 0.02614 -13.76648 13,489
Children			
x_{36} - Has Children	10462		
x_{37} - No Children	10793		
Class of Activity			
x_{38} - Agriculture	46		
x_{39} - Extractive	66		
x_{40} - Mfg. Industry	2695		
x_{41} - Commerce and Transportation	6640		
x_{42} - Service Industries	912		
x_{43} - Government or Other	3964		
x_{44} - Liberal Professions	1787		
x_{45} - Social Services	5205		
Position			
x_{46} - Public Employee	8427		
x_{47} - Employer or Own Account . .	2400		
x_{48} - Private Employee	10586		
Migration			
x_{49} - No Migration	11267		
x_{50} - From Rural	6482		
x_{51} - From Urban	9197		
Environment			
x_{52} - Urban	20555		
x_{53} - Suburban	640		
x_{54} - Rural	60		
Analysis of Variance			
"F" Value		73.51650	114.53413
$R^2(\bar{R}^2)$		0.01027 (.01019)	0.01066 (.01063)
Std. Error of Estimate . . .		0.80629	0.80611

TABLE 60

STATE OF GUANABARA
REGRESSION OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 7						Regression nº 8					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Leg.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Leg.Inc.
Years of University Completed													
x_1 - 1 year	404												
x_2 - 2 years	433												
x_3 - 3 years	447												
x_4 - 4 years	222												
x_5 - 5 years	90												
x_6 - 6 years	0												
Age													
x_7 - 20 years midpoint	318												
x_8 - 22 " "	3772												
x_9 - 27 " "	4532												
x_{10} - 32 " "	3815												
x_{11} - 39 " "	4732												
x_{12} - 49 " "	2605												
x_{13} - 59 " "	1179												
x_{14} - 68 " "	302												
Course Completed													
x_{15} - Secondary	21295												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed through Secondary	0												
Sex													
x_{25} - Female	7127												
x_{26} - Male	14128												

Head of Family			
x_{27} - Not Head	10378		
x_{28} - Head	10877		
Religion			
x_{29} - Protestant	822		
x_{30} - Jewish	511		
x_{31} - Other	2100		
x_{32} - Roman Catholic	17822		
Race			
x_{33} - Black	213		
x_{34} - White	20013		
x_{35} - Other	998		
Children			
x_{36} - Has Children	10062	0.49221 0.51392 0.50888 0.01056 48.80115 24,399	
x_{37} - No Children	10793	Intercept 2.68565	14,668
Class of Activity			
x_{38} - Agriculture	46		0.00216 0.00415 0.81103 0.11673 6.96814 40,667
x_{39} - Extractive	66		0.00311 0.03312 0.52357 0.09769 5.35962 30,477
x_{40} - Mfg. Industry	3635		0.12597 0.11081 0.28146 0.01979 14.82390 25,928
x_{41} - Commerce and Transportation	6680		0.31260 0.11651 0.18041 0.01580 11.81792 23,624
x_{42} - Service Industries	912		0.04291 0.02162 0.12549 0.02891 4.34061 20,469
x_{43} - Government or Other	3948		Intercept 2.89340 18,095
x_{44} - Liberal Professions	1787		0.08407 0.00725 0.06209 0.02245 2.76814 19,211
x_{45} - Social Services	5205		0.24488 -0.20946 -0.25926 0.01660 -15.38178 13,987
Position			
x_{46} - Public Employee	8877		
x_{47} - Employer or Own Account	2800		
x_{48} - Private Employee	10386		
Migration			
x_{49} - No Migration	11267		
x_{50} - From Rural	682		
x_{51} - From Urban	9197		
Environment			
x_{52} - Urban	20955		
x_{53} - Suburban	649		
x_{54} - Rural	60		
Analysis of Variance			
"F" Value		2323.37961	183.24999
R^2 ($\bar{R}^2$)		0.09895 (.09855)	0.05693 (.05667)
Std. Error of Estimate		0.76946	0.78715

TABLE 60

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 9						Regression nº 10					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	404												
x_2 - 2 years	433												
x_3 - 3 years	447												
x_4 - 4 years	222												
x_5 - 5 years	90												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	318												
x_8 - 22 " "	3772												
x_9 - 27 " "	4532												
x_{10} - 32 " "	3815												
x_{11} - 39 " "	4732												
x_{12} - 49 " "	2605												
x_{13} - 59 " "	1179												
x_{14} - 68 " "	302												
Course Completed													
x_{15} - Secondary	21255												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed	[illegible]												
Sex													
x_{25} - Female	7127												
x_{26} - Male	14128												

Head of Family			
z_{27} - Not Head	10978		
z_{28} - Head	10877		
Religion			
z_{29} - Protestant	822		
z_{30} - Jewish	511		
z_{31} - Other	2169		
z_{32} - Roman Catholic	17822		
Race			
z_{33} - Black	213		
z_{34} - White	20013		
z_{35} - Other	998		
Children			
z_{36} - Has Children	10862		
z_{37} - No Children	10795		
Class of Activity			
z_{38} - Agriculture	86		
z_{39} - Extractive	66		
z_{40} - Mfg. Industry	2635		
z_{41} - Commerce and Transportation	6640		
z_{42} - Service Industries	912		
z_{43} - Government or Other	3968		
z_{44} - Liberal Professions	1787		
z_{45} - Social Services	5295		
Position			
z_{46} - Public Employee	8427	Intercept 2.78081	16,132
z_{47} - Employer or Own Account	2400	0.11291 0.24712 0.71671 0.01809 39.62482	33,033
z_{48} - Private Employee	10386	0.48864 -0.00375 0.15224 0.01185 13.29457	18,785
Migration			
z_{49} - No Migration	11267		0.53009 -0.11964 -0.20658 0.01125 -18.36956 17,199
z_{50} - From Rural	642		0.03020 -0.01655 -0.19130 0.03280 -5.83158 17,463
z_{51} - From Urban	9197		Intercept 3.05181 21,185
Environment			
z_{52} - Urban	20555		
z_{53} - Suburban	649		
z_{54} - Rural	60		
Analysis of Variance			
"F" Value		785.22352	171.56929
$R^2(R^2)$		0.06881 (.06878)	0.01589 (.01586)
Std. Error of Estimate		0.78206	0.80398

TABLE 60

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 11						Regression nº 12					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	404							Intercept	3.16332				23,649
z_2 - 2 years	435							0.02037	-0.00266	0.06609	0.03571	1.85097	25,265
z_3 - 3 years	447							0.02103	0.01337	0.07676	0.03513	2.18526	25,536
z_4 - 4 years	222							0.01044	0.01895	0.11657	0.04957	2.35186	26,573
z_5 - 5 years	90							0.00455	0.00954	0.09683	0.10400	0.93103	26,054
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	318							0.01496	-0.12945	-1.07837	0.04256	-25.33947	8.044
z_8 - 22 " "	3772							0.17706	-0.30164	-0.75866	0.01604	-47.30632	11.075
z_9 - 27 " "	4532							0.21322	-0.12090	-0.42030	0.01527	-27.53095	15.534
z_{10} - 32 " "	3815							0.17949	0.03958	-0.17347	0.01598	-10.85573	19.883
z_{11} - 39 " "	4732							Intercept	3.16332				23.649
z_{12} - 49 " "	2605							0.12256	0.19534	0.19855	0.01792	10.78660	28.671
z_{13} - 59 " "	1179							0.05547	0.14890	0.26768	0.02391	11.18953	30.902
z_{14} - 68 " "	302							0.01421	0.04973	0.10464	0.04359	2.40090	26.258
Course Completed													
z_{15} - Secondary	21295												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	7127												
z_{26} - Male	14168												

Head of Family			
z_{27} - Not Head	10578		
z_{28} - Head	10877		
Religion			
z_{29} - Protestant	8112		
z_{30} - Jewish	511		
z_{31} - Other	2180		
z_{32} - Roman Catholic	17652		
Race			
z_{33} - Black	213		
z_{34} - White	20813		
z_{35} - Other	998		
Children			
z_{36} - Has Children	10462		
z_{37} - No Children	10795		
Class of Activity			
z_{38} - Agriculture	46		
z_{39} - Extractive	66		
z_{40} - Mfg. Industry	2633		
z_{41} - Commerce and Transportation	6640		
z_{42} - Service Industries	912		
z_{43} - Government or Other	3948		
z_{44} - Liberal Professions	1787		
z_{45} - Social Services	5295		
Position			
z_{46} - Public Employee	8827		
z_{47} - Employer or Own Account	2600		
z_{48} - Private Employee	10586		
Migration			
z_{49} - No Migration	11267		
z_{50} - From Rural	642		
z_{51} - From Urban	9197		
Environment			
z_{52} - Urban	20555	Intercept 2.94390	18,990
z_{53} - Suburban	640	0.03011 -0.04766 -0.22700 0.05269 -6.98712	15,133
z_{54} - Rural	60	0.00282 -0.02116 -0.33010 0.10464 -5.15469	13,651
Analysis of Variance			
"F" Value		29.18177	421.96964
$R^2(\bar{R}^2)$		0.00274 (.00271)	0.17952 (.17894)
Std. Error of Estimate		0.89933	0.73455

TABLE 60

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 13						Regression nº 14					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	404							Intercept	3.16162				23,609
z_2 - 2 years	433							0.02037	-0.00266	-0.00447	0.03308	-0.13509	23,503
z_3 - 3 years	447							0.02103	0.01337	0.05803	0.03249	1.78612	25,019
z_4 - 4 years	222							0.01044	0.01495	0.05951	0.04590	1.29645	25,056
z_5 - 5 years	50							0.00235	0.00054	0.06529	0.09627	0.67820	25,202
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	318	0.01496	-0.12945	-1.02882	0.04149	-24.79856	7,869	0.01496	-0.12945	-0.73627	0.04030	-18.26799	11,306
z_8 - 22 " "	3772	0.17746	-0.30164	-0.74162	0.01566	-47.34518	10,486	0.17746	-0.30164	-0.48519	0.01690	-28.70681	14,533
z_9 - 27 " "	4532	0.21322	-0.12090	-0.42572	0.01489	-28.58757	14,382	0.21322	-0.12090	-0.27662	0.01491	-18.41621	17,939
z_{10} - 32 " "	3815	0.17949	0.03358	-0.19053	0.01558	-12.23018	18,196	0.17949	0.03358	-0.13768	0.01488	-9.25284	20,572
z_{11} - 39 " "	4732	Intercept	3.09171				22,015	Intercept	3.16162				23,609
z_{12} - 49 " "	2605	0.12256	0.19534	0.17653	0.01786	10.11063	26,265	0.12256	0.19534	0.11527	0.01665	6.92437	26,493
z_{13} - 59 " "	1179	0.05547	0.14890	0.23083	0.02332	9.89816	27,731	0.05547	0.14890	0.11469	0.02234	5.13424	26,478
z_{14} - 68 " "	302	0.01421	0.04973	0.07389	0.04251	1.73791	23,703	0.01421	0.04973	-0.06142	0.04050	-1.51633	22,202
Course Completed													
z_{15} - Secondary	21255												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	7127							0.33531	-0.29212	-0.18221	0.01356	-13.44037	19,676
z_{26} - Male	14128							Intercept	3.16162				23,609

Head of Family												
x_{27} - Not Head	10378							0.48826	-0.48827	-0.25624	0.01257	-19.58319	18,856
x_{28} - Head	10877							Intercept	3.16162				23,609
Religion												
x_{29} - Protestant	822							0.03867	0.06953	0.20782	0.02438	8.52530	29,062
x_{30} - Jewish	511							0.02694	0.06793	0.17471	0.03088	5.65671	28,116
x_{31} - Other	2100							0.09880	0.01119	0.00882	0.01573	0.56082	23,818
x_{32} - Roman Catholic	17822							Intercept	3.16162				23,609
Race												
x_{33} - Black	213							0.01002	-0.04291	-0.26049	0.04683	-5.13524	18,562
x_{34} - White	20013							Intercept	3.16162				23,609
x_{35} - Other	998							0.04695	-0.09295	-0.24875	0.02214	-11.23785	18,809
Children												
x_{36} - Has Children	10662							0.49221	0.51392	0.14217	0.01100	12.91953	27,235
x_{37} - No Children	10795							Intercept	3.16162				23,609
Class of Activity												
x_{38} - Agriculture	46	0.00216	0.04615	0.67656	0.10620	6.37059	43,305	0.00216	0.04615	0.40471	0.10254	3.94678	35,386
x_{39} - Extractive	66	0.00311	0.03312	0.54569	0.08879	6.14616	37,993	0.00311	0.03312	0.47136	0.08528	5.56501	37,939
x_{40} - Mfg. Industry	2635	0.12397	0.11081	0.30192	0.01801	16.76692	29,776	0.12397	0.11081	0.21221	0.02141	9.91364	29,190
x_{41} - Commerce and Transportation	6640	0.31240	0.11651	0.21491	0.01439	14.93787	27,293	0.31240	0.11651	0.11179	0.01805	6.19868	26,401
x_{42} - Service Industries	912	0.04291	0.02162	0.09840	0.02629	3.74283	24,291	0.04291	0.02162	-0.04195	0.02810	-1.49258	22,639
x_{43} - Government or Other	3964	Intercept	3.09171				22,015	Intercept	3.16162				23,609
x_{44} - Liberal Professions	1787	0.08407	0.00723	0.09106	0.02041	4.46210	24,113	0.08407	0.00723	-0.01089	0.02353	-0.63270	23,260
x_{45} - Social Services	5205	0.24488	-0.09940	-0.15801	0.01515	-10.42725	18,797	0.24488	-0.09940	-0.03206	0.01579	-0.83961	23,498
Position												
x_{46} - Public Employee	8827							Intercept	3.16162				
x_{47} - Employer or Own Account	2800							0.11291	0.24712	0.29827	0.02057	14.50318	31,813
x_{48} - Private Employee	10586							0.14844	-0.00375	-0.03012	0.01547	-1.97228	22,908
Migration												
x_{49} - No Migration	11267							0.53009	-0.11948	-0.03762	0.00989	-3.80466	22,737
x_{50} - From Rural	642							0.03020	-0.01695	-0.11880	0.02786	-4.26395	20,940
x_{51} - From Urban	9197							Intercept	3.16162				23,609
Environment												
x_{52} - Urban	20595							Intercept	3.16162				23,609
x_{53} - Suburban	640							0.03011	-0.04766	-0.19243	0.02751	-6.99556	19,476
x_{54} - Rural	60							0.00282	-0.02116	-0.12835	0.08824	-4.85462	15,383
Analysis of Variance												
"F" Value			431.75585								284.15133		
$R^2(\bar{R}^2)$			0.22534 (.22107)								0.29796 (.29892)		
Std. Error of Estimate			0.71526								0.67857		

secondary graduates with some university training (drop-outs), almost no variance is explained by the additional schooling ($\bar{R}^2$ = .00028). Sex has about the same influence as in the university group ($\bar{R}^2$ = .085) and Head of Family is of greater importance ($\bar{R}^2$ = .167 versus .094 among college graduates). Race and Religion explain about one percent each but almost ninety-five percent of the sample is reported as White. Having children versus not having children explains nearly ten percent of variance compared with only five percent in the university sample. In each of the other regions, Class of Activity explains two to three times the income variance in the secondary samples as it does in the university graduate samples. This is not the case in Guanabara. The $\bar{R}^2$ of the Class of Activity regression for secondary graduates is only .057 compared with .046 for the university group. This suggests that the market for skills produced by secondary education is more uniform and, hence, probably more competitive between industries than is the case in other areas. The fact that the size of the labor market in Guanabara is comparatively large would also contribute to this phenomenon. Position in Occupation accounts for about six percent of variance compared to one percent for college graduates. Migration history and current environment explain very little total variance with $\bar{R}^2$ values of .016 and .003 respectively.

The variance explained by all variables regressed together is greater than that explained by the same variables

in the university graduates sample. The difference, however, is smaller than is the case in the other areas studied.

The age-income profile for this group, Figure 45, shows the expected level and shape when compared to university graduates in the same state. The rate of income increase of the younger groups is substantially less than that of the college graduates as is the rate of decrease after age sixty.

Philosophy Graduates.--Among graduates in Philosophy, Table 61 shows that those completing a four-year university course earn slightly more than those completing three years. Sex and Head of Family variables have almost identical effects on income with Males and Heads of Family showing considerably higher incomes than their counterparts. Protestants earn more than Jews, and both groups earn more than Roman Catholics or persons with "Other Religions." Whites earn significantly more than mulattoes or Blacks, and those with children have higher incomes than those without. With the exception of one graduate in the agricultural field, there are no significant differences in income in different Classes of Activity. However, Private Employees have incomes lower than Public Employees or Employers. Incomes of persons having migrated from an urban area are greater than those of persons without a migration history or having migrated from a rural area, and urban dwellers earn more than suburban residents.

An interview with the head of the teachers' syndicate yielded government wage figures for teachers during

TABLE 61

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF GRADUATES OF PHILOSOPHY

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Regression nº 2 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	119							Intercept 3.62586					37,557
z_4 - 4 years	1120							0.90395	-0.00831	0.08445	0.07694	1.09756	40,867
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	86	0.06941	-0.19075	-0.81919	0.10076	-8.13027	13,633	0.06941	-0.19075	-0.46970	0.10053	-4.67230	23,480
z_9 - 27 " "	233	0.18805	-0.18742	-0.52715	0.07099	-7.70687	17,895	0.18805	-0.18742	-0.37847	0.06938	-5.45475	25,723
z_{10} - 32 " "	290	0.23406	-0.03991	-0.26782	0.06673	-4.01371	23,661	0.23406	-0.03991	-0.16734	0.06337	-2.64065	31,770
z_{11} - 39 " "	340	Intercept 3.43166					30,928	Intercept 3.62586					37,557
z_{12} - 49 " "	168	0.13559	0.15688	0.14451	0.07872	1.83570	35,736	0.13559	0.15688	0.01658	0.07441	0.22284	38,185
z_{13} - 59 " "	94	0.07587	0.08398	0.05380	0.09728	0.55309	32,637	0.07587	0.08398	-0.13579	0.09338	-1.45421	32,788
z_{14} - 68 " "	28	0.02260	-0.00666	-0.24282	0.16412	-1.47951	24,260	0.02260	-0.00666	-0.43459	0.15519	-2.80038	24,319
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	1239												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	569							0.45924	-0.31687	-0.27131	0.09712	-4.78953	28,633
z_{26} - Male	670							Intercept 3.62586					37,557

Head of Family								
z_{27} - Not Head	590		0.47619	-0.37228	-0.29754	0.08113	-4.86749	27,898
z_{28} - Head	649		Intercept	3.62586				37,557
Religion								
z_{29} - Protestant	88		0.07108	0.12133	0.27700	0.08976	3.08606	40,584
z_{30} - Jewish	58		0.04681	0.02906	0.15498	0.10771	1.43996	43,811
z_{31} - Other	169		0.13640	0.00876	-0.02621	0.06574	-0.39860	36,586
z_{32} - Roman Catholic	984		Intercept	3.62586				37,557
Race								
z_{33} - Black	8		0.00646	-0.02566	-0.36879	0.27769	-1.32804	25,974
z_{34} - White	1282		Intercept	3.62586				37,557
z_{35} - Other	28		0.02260	-0.08246	-0.25538	0.15078	-1.69367	29,038
Children								
z_{36} - Has Children	637		0.51412	0.22355	0.12160	0.04855	2.50435	42,413
z_{37} - No Children	602		Intercept	3.62586				37,557
Class of Activity								
z_{38} - Agriculture	1		0.00081	0.06685	1.61929	0.79775	2.02982	189,625
z_{39} - Extractive	3		0.00242	0.00255	0.19438	0.48246	0.40290	45,615
z_{40} - Mfg. Industry	79		0.06376	0.11333	0.22247	0.18376	1.21087	46,915
z_{41} - Commerce and Transportation	119		0.09443	0.10417	0.15469	0.17654	0.87620	43,840
z_{42} - Service Industries	84		Intercept	3.62586				37,557
z_{43} - Government or Other	138		0.11138	0.01723	-0.00308	0.17807	-0.01729	37,468
z_{44} - Liberal Professions	18		0.01453	0.00763	0.01750	0.24510	0.07138	38,220
z_{45} - Social Services	859		0.69330	-0.15346	-0.03681	0.16826	-0.21190	36,272
Position								
z_{46} - Public Employee	563		Intercept	3.62586				37,557
z_{47} - Employer or Own Account	122		0.09847	0.10977	0.01444	0.08436	0.16926	38,184
z_{48} - Private Employee	552		0.44552	-0.03670	-0.13262	0.05207	-2.54674	32,892
Migration								
z_{49} - No Migration	588		0.47458	-0.15913	-0.12191	0.04828	-2.52514	33,847
z_{50} - From Rural	38		0.03067	-0.00057	-0.16851	0.13225	-1.27424	31,733
z_{51} - From Urban	597		Intercept	3.62586				37,557
Environment								
z_{52} - Urban	1208		Intercept	3.62586				37,557
z_{53} - Suburban	31		0.02502	-0.07444	-0.44080	0.14520	-3.03570	24,149
z_{54} - Rural	0							
Analysis of Variance								
"F" Value		24.39813			13.99388			
$R^2(\bar{R}^2)$		0.10620 (.10259)			0.23788 (.22146)			
Std. Error of Estimate		0.83477			0.77752			

GUANABARA - AGE/INCOME PROFILES - 1960

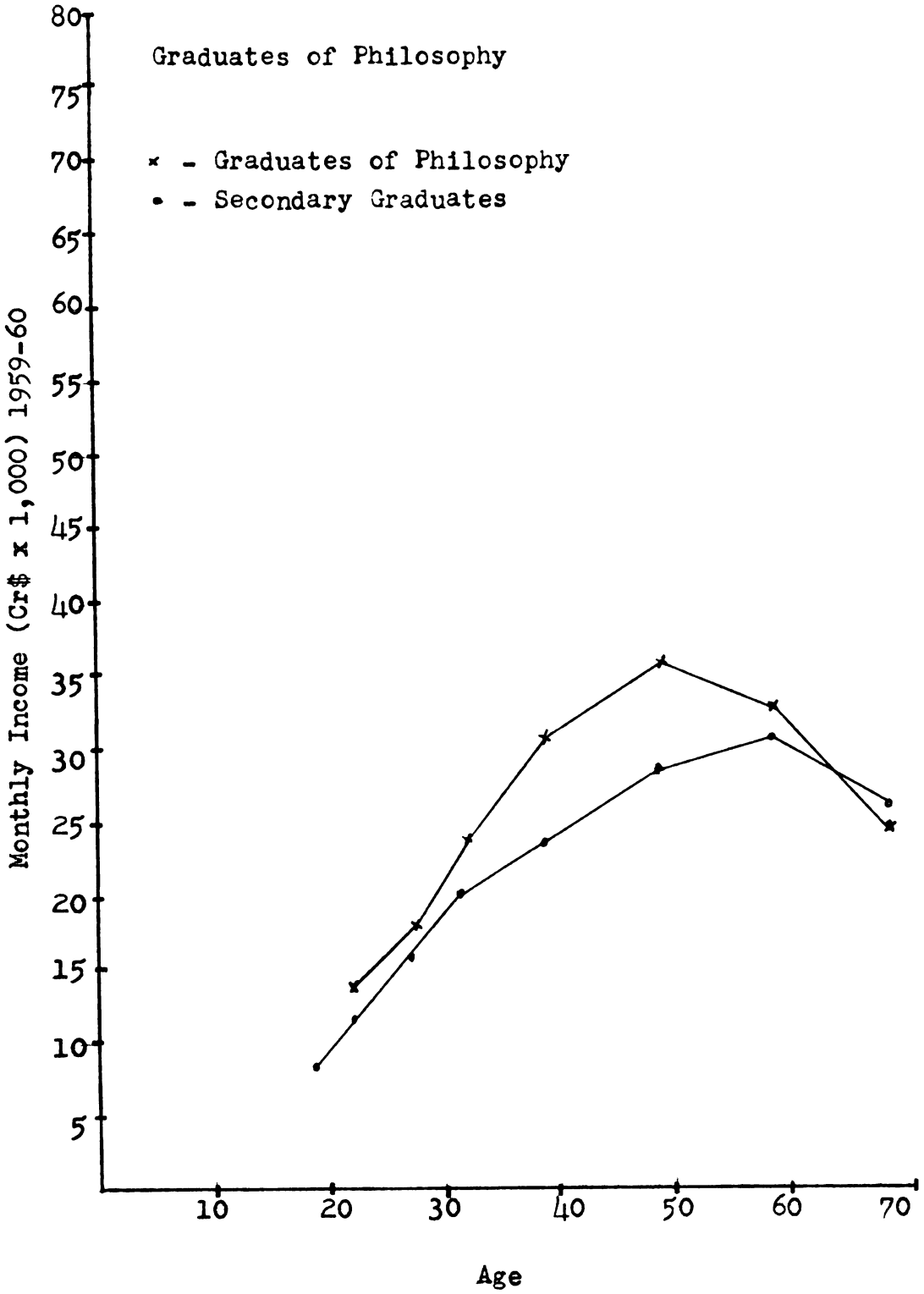


Fig. 46

the 1959-60 period which substantiated the level of earnings reflected in the age-income profile (Figure 46).[1]

Medicine.--Table 62 contains the regressions on log income using the sample of graduates in Medicine. Females, non-Heads of Family, and those without children have significantly lower incomes than their counterparts. "Other Religions" lead Roman Catholics who, in turn, lead Jews in earnings. Protestant earnings are not significantly different from those of Roman Catholics. White incomes are higher than those of mulattoes but only slightly more than Blacks. No significant differences in earnings exist between different Classes of Activity. Employers or persons Self-Employed have higher incomes than Public or Private Employees. Neither migration history nor current environment produces significant income differences.

The age-income profile of graduates of Medicine, (Figure 47) is substantially different from those of other areas. In addition to being higher, the retirement age is considerably greater than in any of the other regions. This fact was hypothesized by persons interviewed in all the other areas prior to receiving the data from Guanabara and is discussed in Chapter IV.

Pharmacy.--The regression results for the sample of Pharmacy graduates contained in Table 63 and Figure 48 are most interesting because of the small income differences that

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[1]Personal interview with Alfonso Saldanha, Presidente, Sindicato dos Professores da Guanabara (Ensino Secundario e Primario) Rio de Janeiro, August 1968.

TABLE 62

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF MEDICINE

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	2358												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 "	28	0.01187	-0.14833	-1.30754	0.17391	-7.86161	11,909	0.01187	-0.14833	-1.01817	0.17325	-5.87674	14,264
z_9 - 27 "	302	0.12807	-0.28776	-0.76182	0.06340	-12.33126	21,391	0.12807	-0.28776	-0.55543	0.06630	-8.37741	22,657
z_{10} - 32 "	330	0.13995	-0.11299	-0.32402	0.06158	-5.26158	33,811	0.13995	-0.11299	-0.24398	0.06042	-4.03796	30,936
z_{11} - 39 "	604	Intercept 3.84480					46,769	Intercept 3.67589					39,684
z_{12} - 49 "	695	0.29474	0.18206	0.22230	0.05004	4.44214	58,388	0.29474	0.18206	0.13646	0.04917	2.77493	45,257
z_{13} - 59 "	286	0.12129	0.12644	0.27938	0.06457	4.32659	61,817	0.12129	0.12644	0.16825	0.06356	2.64723	46,718
z_{14} - 68 "	113	0.04792	0.06347	0.22352	0.09221	2.42415	58,459	0.04792	0.06347	0.08620	0.09028	0.95485	43,038
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	2358												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	217							0.09203	-0.18236	-0.29464	0.06897	-4.27202	29,408
z_{26} - Male	2141							Intercept 3.67589					39,684

Head of Family							
z_{27} - Not Head	489		0.20738	-0.28045	-0.19553	0.05342	-3.64886	32,471
z_{28} - Head	1869		Intercept	3.67589				39,484
Religion							
z_{29} - Protestant	51		0.02163	-0.01183	-0.11915	0.12699	-0.93331	35,049
z_{30} - Jewish	94		0.03986	-0.06177	-0.18043	0.09269	-1.94656	32,985
z_{31} - Other	289		0.11408	0.04089	0.09414	0.05705	1.69071	40,281
z_{32} - Roman Catholic	1944		Intercept	3.67589				39,484
Race							
z_{33} - Black	8		0.00339	-0.01391	-0.19146	0.31082	-0.61598	32,604
z_{34} - White	2314		Intercept	3.67589				39,484
z_{35} - Other	33		0.01399	-0.04882	-0.28336	0.15394	-1.84073	29,781
Children							
z_{36} - Has Children	1582		0.67091	0.26698	0.25160	0.04265	5.89845	50,779
z_{37} - No Children	776		Intercept	3.67589				39,484
Class of Activity							
z_{38} - Agriculture	2		0.00085	0.00629	-0.07334	0.69176	-0.10602	36,092
z_{39} - Extractive	0							
z_{40} - Mfg. Industry	37		0.01569	0.04098	0.16883	0.34131	0.49464	46,765
z_{41} - Commerce and Transportation	69		0.02926	0.05298	0.12943	0.32636	0.39657	44,939
z_{42} - Service Industries	8		Intercept	3.67589				39,484
z_{43} - Government or Other	486		0.17218	0.01848	0.08498	0.31506	0.26972	42,986
z_{44} - Liberal Professions	770		0.32655	0.14683	-0.01585	0.31164	-0.05086	38,848
z_{45} - Social Services	1066		0.45208	-0.18234	-0.04396	0.31245	-0.14070	37,786
Position							
z_{46} - Public Employee	1338		Intercept	3.67589				39,484
z_{47} - Employer or Own Account	717		0.30407	0.17704	0.29862	0.08879	3.34321	53,884
z_{48} - Private Employee	308		0.12765	-0.08127	0.08149	0.06739	1.20938	42,836
Migration							
z_{49} - No Migration	991		0.42027	-0.06750	-0.04428	0.08711	-1.19308	37,778
z_{50} - From Rural	98		0.02460	0.00618	-0.08271	0.11889	-0.69566	36,390
z_{51} - From Urban	1296		Intercept	3.67589				39,484
Environment							
z_{52} - Urban	2311		Intercept	3.67589				39,484
z_{53} - Suburban	45		0.01908	-0.01599	-0.18388	0.13212	-1.39175	32,892
z_{54} - Rural	2		0.00085	-0.01982	-0.67373	0.62137	-1.08425	28,129
Analysis of Variance							
"F" Value		67.47385			23.97028			
$R^2(\bar{R}^2)$		0.14690 (.14516)			0.21097 (.20252)			
Std. Error of Estimate		0.89961			0.84888			

GUANABARA - AGE/INCOME PROFILES - 1960

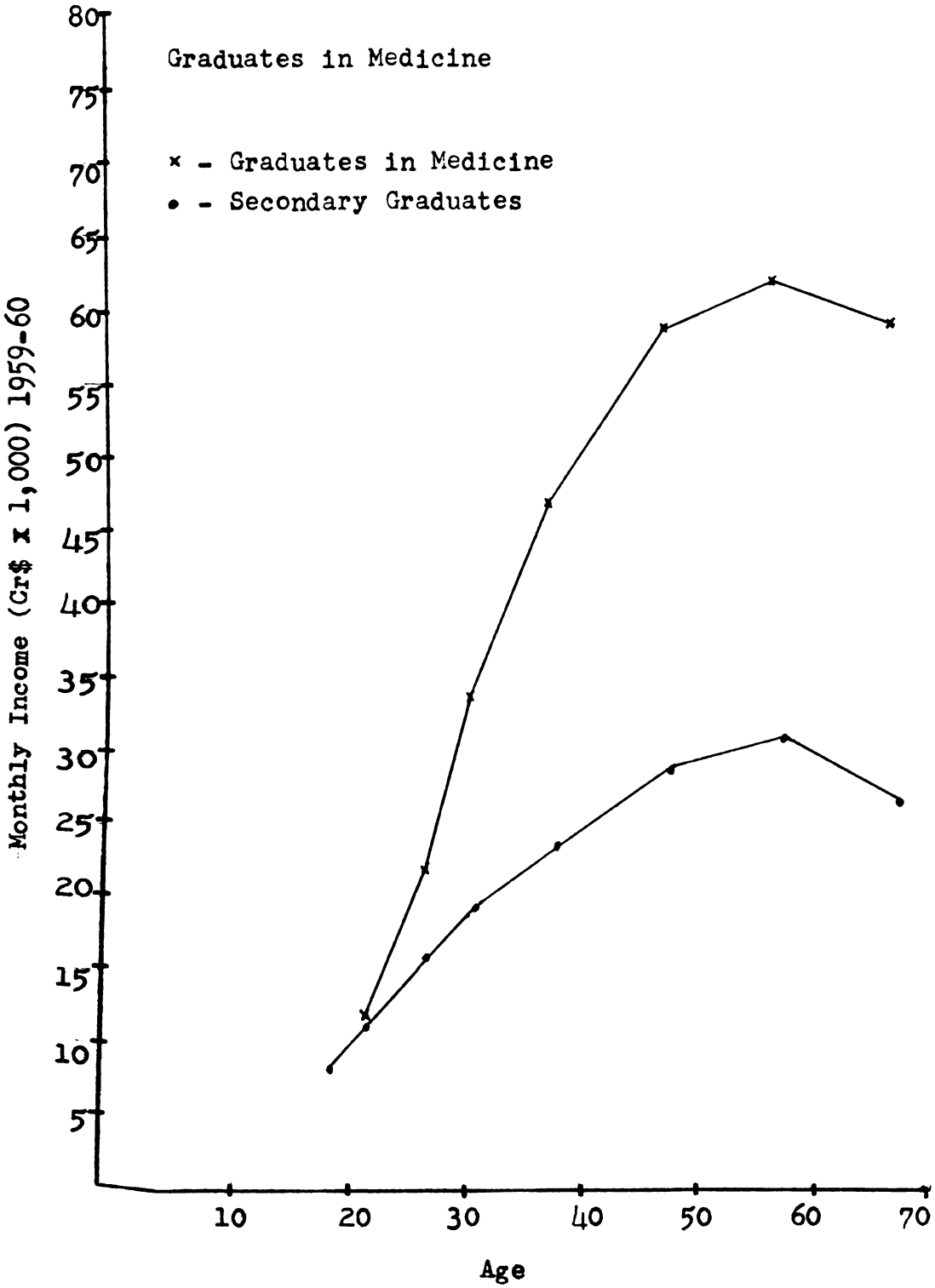


Fig. 47

TABLE 63

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF PHARMACY

Variable Number and Description	Sample Size	Regression n°						Regression n°					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Leg.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Leg.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	92							Intercept 3.65897					38,705
z_4 - 4 years	225							0.70978	-0.01060	-0.04821	0.10286	-0.46514	38,060
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	8	0.01577	-0.06817	-0.46664	0.42736	-1.09199	18,671	0.01577	-0.06817	-0.47917	0.40115	-1.19449	38,970
z_9 - 27 " "	48	0.15148	-0.14099	-0.89808	0.17834	-1.65457	18,604	0.15148	-0.14099	-0.25725	0.15606	-1.75092	39,048
z_{10} - 32 " "	56	0.17280	-0.06880	-0.16948	0.17197	-0.94451	21,943	0.17280	-0.06880	-0.14234	0.15946	-0.89260	38,870
z_{11} - 39 " "	80	Intercept 3.81845					24,999	Intercept 3.65897					38,705
z_{12} - 49 " "	77	0.84290	0.82068	0.40726	0.15875	2.56650	37,541	0.84290	0.82068	0.26496	0.14726	1.79942	39,448
z_{13} - 59 " "	49	0.15487	0.07286	0.15897	0.17725	1.03685	30,034	0.15487	0.07286	0.07939	0.15899	0.49709	41,905
z_{14} - 69 " "	24	0.07571	-0.10966	-0.54181	0.22215	-1.83745	17,780	0.07571	-0.10966	-0.69379	0.20290	-2.43365	33,088
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	317												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	78							0.66282	-0.24640	-0.68880	0.14457	-4.25978	30,655
z_{26} - Male	239							Intercept 3.65897					38,705
Head of Family													
z_{27} - Not Head	91							0.65707	-0.22214	-0.62860	0.13721	-0.21889	37,975
z_{28} - Head	226							Intercept 3.65897					38,705

			Religion					
x_{29} - Protestant	13		0.04101	0.82016	1.04398	0.829#3	4.36395	109,945
x_{30} - Jewish	14		0.04418	0.14338	0.70461	0.93501	2.99217	78,308
x_{31} - Other	24		0.07571	-0.07431	0.08035	0.18430	0.11041	29,501
x_{32} - Roman Catholic	886		Intercept	2.65297				26,706
			Race					
x_{33} - Black	2		0.00946	0.03421	0.42891	0.46828	0.49514	46,130
x_{34} - White	926		Intercept	2.65297				26,706
x_{35} - Other	12		0.03756	-0.09963	-0.84315	0.92199	-0.96489	30,961
			Children					
x_{36} - Has Children	193		0.60853	0.18870	-0.04251	0.11196	-0.44496	26,836
x_{37} - No Children	134		Intercept	2.65297				26,706
			Class of Activity					
x_{38} - Agriculture	1		0.00318	-0.06887	-1.37x7	0.88237	-1.54959	9,813
x_{39} - Extractive	0							
x_{40} - Mfg. Industry	66		0.20380	0.90825	0.34265	0.27701	1.44958	54,578
x_{41} - Commerce and Transportation	129		0.40694	0.03685	-0.09711	0.22194	-0.09990	27,859
x_{42} - Service Industries	8		0.00631	-0.00908	-0.16694	0.62666	-0.26640	32,754
x_{43} - Government or Other	22		Intercept	2.65297				26,706
x_{44} - Liberal Professions	12		0.03785	-0.08231	0.04808	0.29240	0.14881	40,520
x_{45} - Social Services	85		0.17360	-0.17625	0.13670	0.16808	-0.88588	28,528
			Position					
x_{46} - Public Employee	100		Intercept	2.65297				26,706
x_{47} - Employer or Own Account	66		0.28614	0.17847	-0.06064	0.30745	-0.89231	26,468
x_{48} - Private Employee	135		0.41540	-0.08254	-0.21654	0.19051	-1.06313	29,196
			Migration					
x_{49} - No Migration	104		0.32808	-0.13058	-0.20060	0.10366	-1.92530	31,670
x_{50} - From Rural	18		0.05678	-0.13065	-0.53464	0.21122	-2.51928	22,026
x_{51} - From Urban	198		Intercept	2.65297				26,706
			Environment					
x_{52} - Urban	297		Intercept	2.65297				26,706
x_{53} - Suburban	80		0.08309	-0.06856	-0.17883	0.19093	-0.89366	26,207
x_{54} - Rural	0							
			Analysis of Variance					
"F" Value		4.71273					2.49200	
R^2 ($\bar{R}^2$)		.08388 (.06885)					.28798 (.26946)	
Std. Error of Estimate		0.91780					0.81278	

GUANABARA - AGE/INCOME PROFILES - 1960

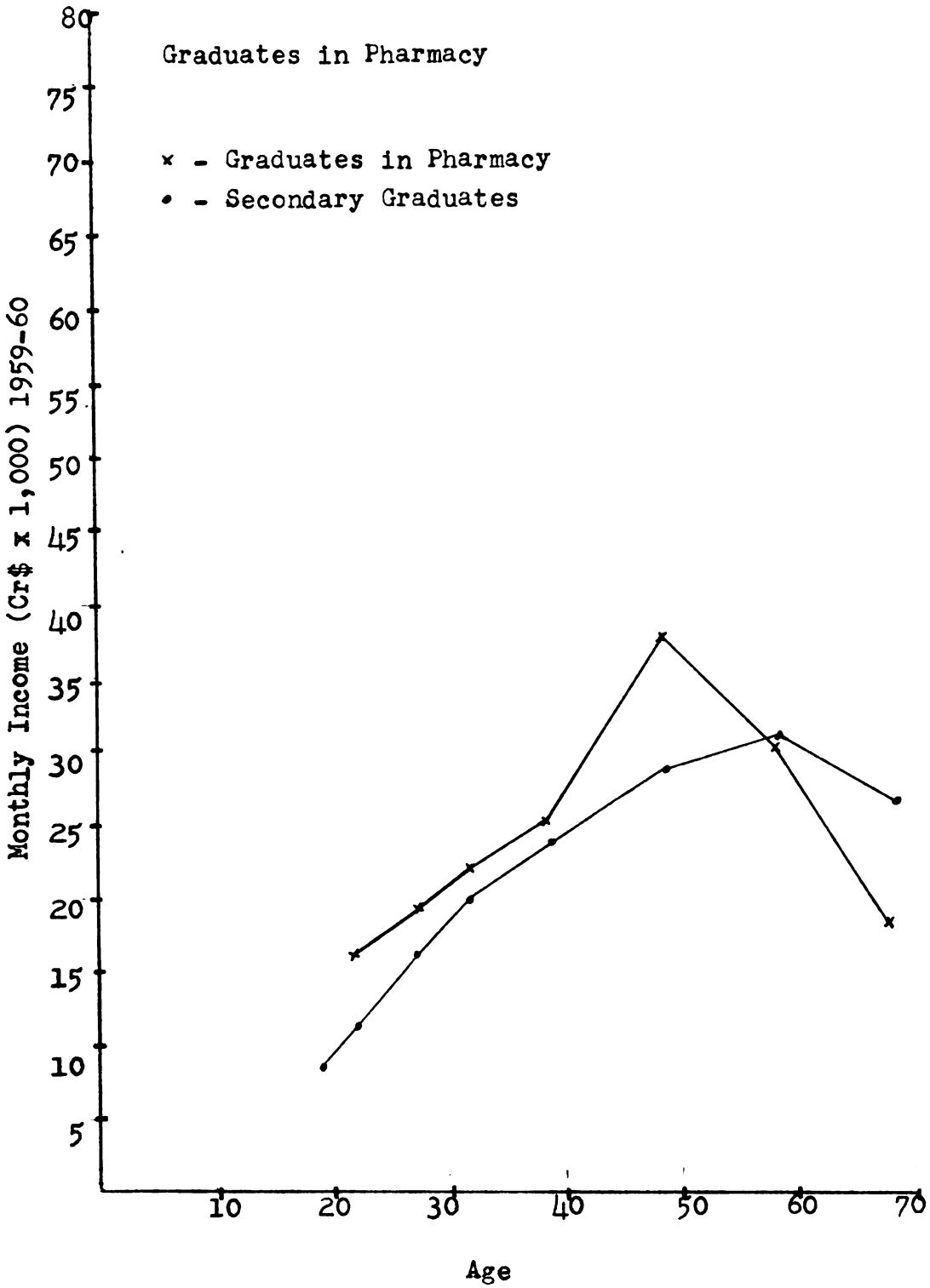


Fig. 48

exist within many classes of variables. Women earn less than men but neither Head of Family nor Children produce significant differences. Similarly, Race, Class of Activity, and Environment do not relate to significant income differences. Protestants earn more than Jews who, in turn, earn more than Roman Catholics or "Other Religions." Private Employees earn less than Employers or Public Employees and migrants from urban areas have higher incomes than those of rural migrants or those of persons without migration history.

Interviews indicate that the apparent early retirement shown by the age-income profile for this group may actually reflect the poorer quality of education of the older group.

Dentistry.--Table 64 and Figure 49 contain the regression results and age-income profiles of Dentistry graduates from Guanabara. No income differences are shown between the group completing a three-year and four-year curriculum. The usual pattern of higher earnings to Males, Heads of Family, and persons with children exists. Religion does not yield significant differences. Whites and Blacks (only seven) earn more than mulattoes, and those persons in Social Services and Liberal Professions earn less than other Classes of Activity. Those persons working for their own account or as Employers earn more than Private Employees who, in turn, earn more than Public Employees. Migrants from rural areas have lower incomes than persons with no migration history or than migrants from urban areas, and urban residents earn more than suburban.

TABLE 64

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF GRADUATES OF DENTISTRY

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	195							Intercept 3.48902					32,754
z_4 - 4 years	804							0.80480	0.00123	-0.00582	0.05930	-0.09821	32,564
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	17	0.01702	-0.09366	-0.69921	0.19196	-3.64243	16,193	0.01702	-0.09366	-0.48162	0.18999	-2.53497	20,235
z_9 - 27 " "	128	0.12813	-0.19567	-0.53936	0.08051	-6.69891	19,000	0.12813	-0.19567	-0.31895	0.08506	-3.74958	23,809
z_{10} - 32 " "	177	0.17718	-0.06363	-0.24313	0.07208	-3.37320	25,550	0.17718	-0.06363	-0.13459	0.07059	-1.90670	28,629
z_{11} - 39 " "	325	Intercept 3.48377					32,582	Intercept 3.48902					32,754
z_{12} - 49 " "	206	0.20621	0.08251	-0.00586	0.06871	-0.08522	32,392	0.20621	0.08251	-0.05083	0.06656	-0.76365	31,131
z_{13} - 59 " "	94	0.09409	0.03248	-0.05133	0.09036	-0.60131	30,859	0.09409	0.03248	-0.09269	0.08781	-1.05552	29,854
z_{14} - 68 " "	52	0.05205	0.01745	-0.07521	0.11521	-0.65267	30,222	0.05205	0.01745	-0.14455	0.11173	-1.29368	28,346
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	999												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed	[illegible] 0												
Sex													
z_{25} - Female	123							0.12312	-0.21448	-0.28050	0.08383	-2.63044	26,272
z_{26} - Male	876							Intercept 3.48902					32,754

Head of Family							
z_{27} - Not Head	266		0.26627	-0.27005	-0.20193	0.06811	-2.96402	26,765
z_{28} - Head	733		Intercept	3.68902				32,754
Religion							
z_{29} - Protestant	31		0.05103	-0.04055	-0.16562	0.13606	-1.21726	27,795
z_{30} - Jewish	41		0.04104	0.03613	0.09000	0.11885	0.75785	35,888
z_{31} - Other	123		0.12312	-0.05106	-0.11250	0.07233	-1.55542	29,269
z_{32} - Roman Catholic	804		Intercept	3.68902				32,754
Race							
z_{33} - Black	7		0.00701	-0.01665	-0.08816	0.28158	-0.31309	29,990
z_{34} - White	965		Intercept	3.68902				32,754
z_{35} - Other	27		0.02708	-0.11460	-0.39698	0.14534	-2.73131	22,682
Children							
z_{36} - Has Children	683		0.68368	0.22895	0.15733	0.05708	2.75746	38,334
z_{37} - No Children	316		Intercept	3.68902				32,754
Class of Activity							
z_{38} - Agriculture	1		0.00100	0.00821	-0.51192	0.74607	-0.68616	19,681
z_{39} - Extractive	1		0.00100	0.07774	1.18021	0.74537	1.58339	186,686
z_{40} - Mfg. Industry	21		0.02102	0.10060	0.21996	0.19243	1.14185	40,812
z_{41} - Commerce and Transportation	49		0.04905	0.08843	-0.00875	0.14836	-0.05894	32,449
z_{42} - Service Industries	4		0.00400	-0.00047	-0.44558	0.39350	-1.13236	28,977
z_{43} - Government or Other	136		Intercept	3.68902				32,754
z_{44} - Liberal Professions	661		0.66166	0.00158	-0.42640	0.13854	-3.07780	21,388
z_{45} - Social Services	126		0.12613	-0.11497	-0.22461	0.09367	-2.39794	26,185
Position							
z_{46} - Public Employee	261		Intercept	3.68902				32,754
z_{47} - Employer or Own Account	610		0.61061	0.11918	0.47757	0.12672	3.76879	52,804
z_{48} - Private Employee	128		0.12813	-0.05952	0.21053	0.11951	1.76165	40,489
Migration							
z_{49} - No Migration	436		0.43644	-0.05920	-0.06140	0.04876	-1.25931	30,848
z_{50} - From Rural	36		0.03604	-0.02044	-0.25319	0.12785	-1.98089	25,427
z_{51} - From Urban	520		Intercept	3.68902				32,754
Environment							
z_{52} - Urban	968		Intercept	3.68902				32,754
z_{53} - Suburban	28		0.02803	-0.07994	-0.35136	0.14209	-2.47286	23,890
z_{54} - Rural	3		0.00300	-0.02483	-0.22681	0.43422	-0.51773	26,199
Analysis of Variance								
"F" Value		10.79717			7.40361			
R^2 ($\bar{R}^2$)		0.06130 (.05658)			0.17608 (.15318)			
Std. Error of Estimate		0.77156			0.73100			

GUANABARA - AGE/INCOME PROFILES - 1960

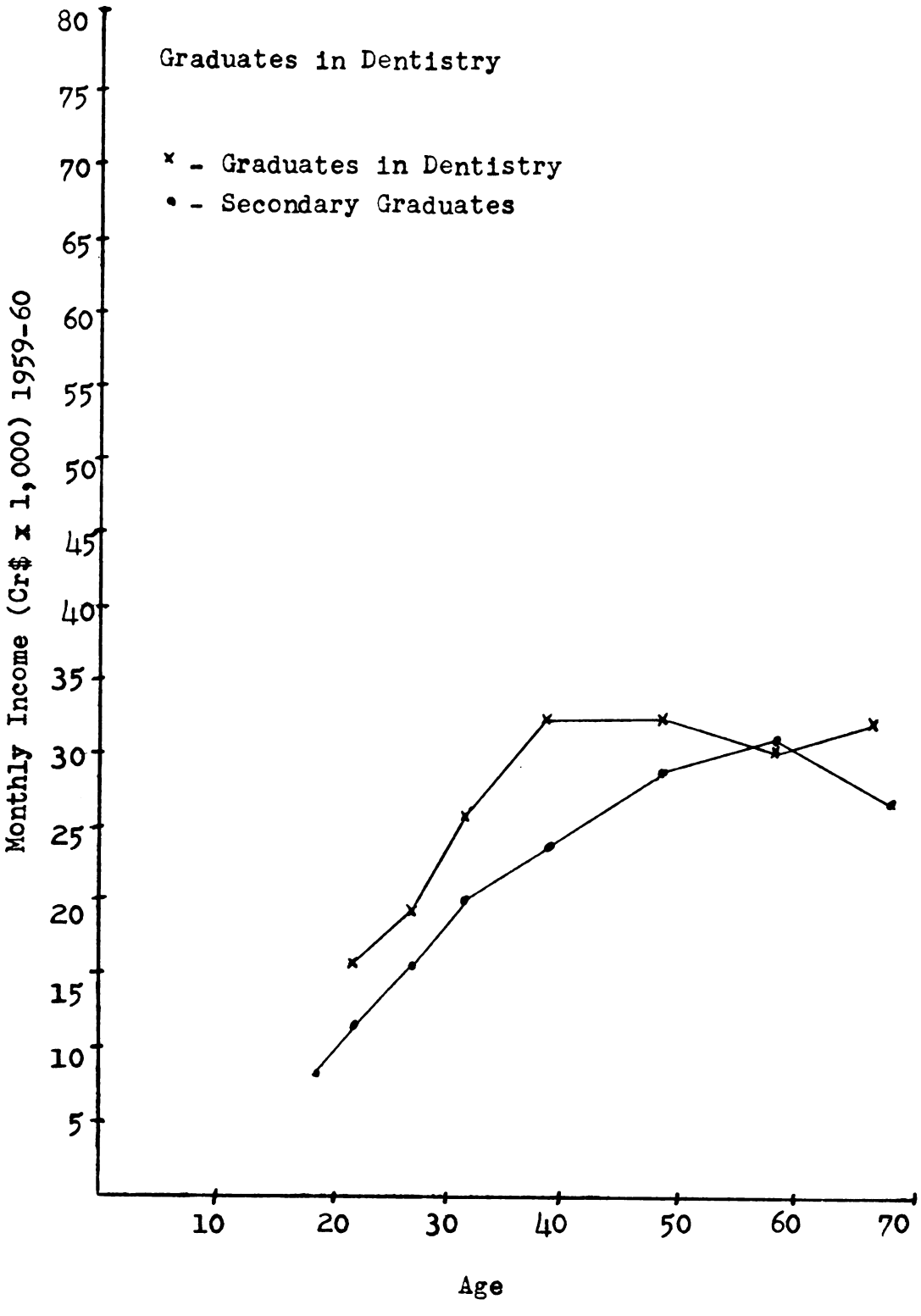


Fig. 49

The age-income profile plus interview results indicate a strong possibility of poorer quality education among the older graduates.

Engineering.--Male, Head of Family, and Has Children variables are all consistent with incomes higher than their counterparts according to regressions from the sample of Engineering graduates contained in Table 65 and Figure 50. Protestants earn more than Roman Catholics and the latter earn more than either Jews or "Other Religions." Whites earn significantly more than non-whites. Class of Activity variables fall into three levels of income; the highest consisting of engineers in Extractive Industries followed by those in Agriculture, Manufacturing, Commerce/Transportation, Government, Liberal Professions, or Social Services; and the lowest group income is Service Industry. Employers or Self-Employed persons have higher incomes than Private Employees, who, in turn, have greater earnings than Public Employees. Migration history does not produce significant income differences but the Urban variable is consistent with higher earnings than Suburban or Rural.

The shape of the age-income profile is similar to those found in other areas and is characterized by a rapid and early rise followed by fairly constant earnings until the beginning of retirement at or about age sixty. The peak earning years show the highest income of any profession or area studied.

TABLE 65

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF ENGINEERING

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Regression nº 2 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	2191												
z_6 - 6 years	0												
Age													
z_7 - 20 years midpoint	0												
z_8 - 22 " "	42	0.01917	-0.05475	-0.51851	0.14846	-3.49255	44,361	0.01917	-0.05475	-0.28208	0.14754	-1.91192	41,413
z_9 - 27 " "	265	0.12095	-0.17741	-0.60090	0.06840	-8.78470	40,871	0.12095	-0.17741	-0.42618	0.07137	-5.97176	35,855
z_{10} - 32 " "	396	0.18074	-0.02917	-0.20524	0.05998	-3.42197	60,708	0.18074	-0.02917	-0.18687	0.05835	-3.20278	45,549
z_{11} - 39 " "	615	Intercept	4.31131				74,538	Intercept	4.00566				54,908
z_{12} - 49 " "	440	0.20082	0.04574	-0.09367	0.05812	-1.02311	70,235	0.20082	0.04574	-0.09313	0.05597	-1.66379	50,026
z_{13} - 59 " "	327	0.14925	0.06400	-0.00094	0.06371	-0.01469	74,469	0.14925	0.06400	-0.06131	0.06168	-0.99405	51,843
z_{14} - 68 " "	106	0.04838	-0.03597	-0.29787	0.09790	-3.04265	55,337	0.04838	-0.03597	-0.37721	0.09468	-3.98387	37,655
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	2191												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	30							0.01369	-0.10416	-0.34846	0.16913	-2.06374	38,714
z_{26} - Male	2161							Intercept	4.00566				54,908

Head of Family								
z_{27} - Not Head	336		0.15335	-0.19778	-0.29433	0.06253	-4.70698	40,908
z_{28} - Head	1877		Intercept	4.00566				58,908
Religion								
z_{29} - Protestant	179		0.08170	0.11006	0.23762	0.07243	3.28055	69,496
z_{30} - Jewish	149		0.06709	-0.09081	-0.22725	0.07806	-2.91130	49,789
z_{31} - Other	246		0.11228	-0.09815	-0.16491	0.06199	-2.66004	46,582
z_{32} - Roman Catholic	1489		Intercept	4.00566				58,908
Race								
z_{33} - Black	5		0.00228	-0.03920	-0.07128	0.39986	-1.67879	28,082
z_{34} - White	2144		Intercept	4.00566				58,908
z_{35} - Other	38		0.01734	-0.01622	-0.24310	0.14841	-1.63802	43,079
Children								
z_{36} - Has Children	1470		0.67093	0.14001	0.10545	0.04534	2.32574	61,815
z_{37} - No Children	721		Intercept	4.00566				58,908
Class of Activity								
z_{38} - Agriculture	10		0.00456	0.01898	0.38305	0.32179	1.19036	80,537
z_{39} - Extractive	30		0.01369	0.03983	0.29479	0.18173	1.62211	73,733
z_{40} - Mfg. Industry	670		0.30580	0.02192	0.03987	0.06313	0.47961	57,148
z_{41} - Commerce and Transportation	297		0.13555	0.03769	0.06254	0.08680	0.72047	58,452
z_{42} - Service Industries	27		0.01232	-0.05879	-0.60991	0.18757	-3.25107	29,837
z_{43} - Government or Other	336		Intercept	4.00566				58,908
z_{44} - Liberal Professions	719		0.32816	0.06634	-0.05200	0.08778	-0.36454	53,179
z_{45} - Social Services	102		0.04655	-0.05066	0.00555	0.10142	0.05475	55,214
Position								
z_{46} - Public Employee	524		Intercept	4.00566				58,908
z_{47} - Employer or Own Account	601		0.27430	0.16499	0.58121	0.08028	6.76118	98,339
z_{48} - Private Employee	1062		0.48471	-0.00019	0.29548	0.07108	4.15675	73,782
Migration								
z_{49} - No Migration	821		0.37471	-0.03421	0.01998	0.04107	0.48641	56,016
z_{50} - From Rural	32		0.01461	-0.02868	-0.18129	0.16401	-1.10540	45,804
z_{51} - From Urban	1319		Intercept	4.00566				58,908
Environment								
z_{52} - Urban	2155		Intercept	4.00566				58,908
z_{53} - Suburban	31		0.01415	-0.06188	-0.48765	0.16584	-2.93930	33,782
z_{54} - Rural	5		0.00228	-0.04724	-1.21460	0.44292	-2.74125	16,298
Analysis of Variance								
"F" Value		16.88426			12.58592			
R^2 ($\bar{R}^2$)		0.04433 (.04216)			0.13580 (.12502)			
Std. Error of Estimate		0.93089			0.88971			

GUANABARA - AGE/INCOME PROFILES - 1960

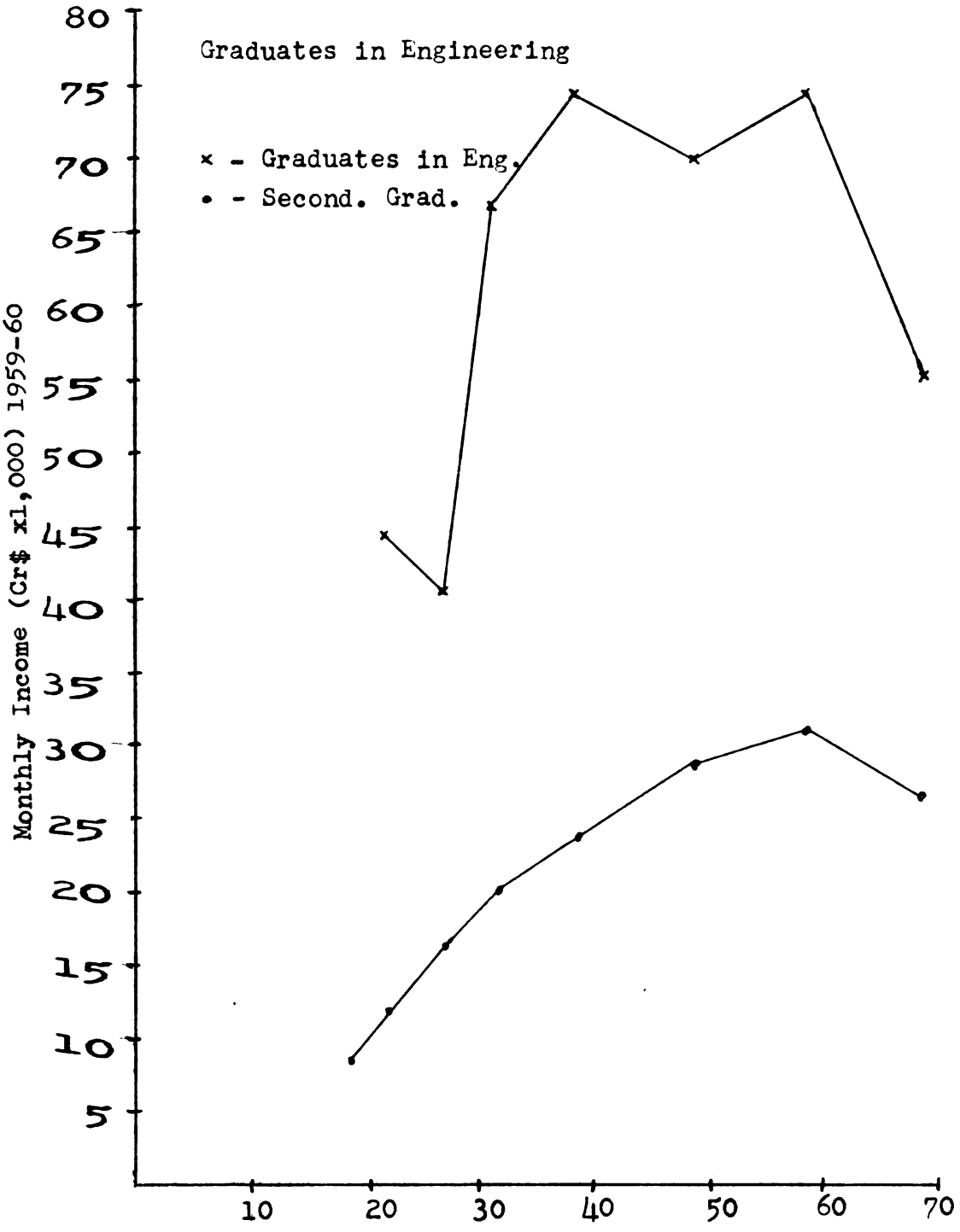


Fig. 50

Law.--The regressions contained in Table 66 for graduates of Law show the now typical pattern of higher incomes to Males, Heads of Family, and those with children. No significant differences exist within the class of Religion, hosever. Whites have greater earnings than non-whites. Within Class of Activity, three groupings are possible with the highest incomes found in Agriculture and Manufacturing; the median group consisting of Extractive Industry, Commerce/ Transportation, Service Industries, and Government; and the lowest group made up of Liberal Professions and Social Services. Employers and Self-Employed persons have higher incomes than do either Private Employees or Public Employees. Persons with no migration history or migrants from urban areas have greater earnings than migrants from rural areas. Differences in current environment are not consistent with significant income differences, although the non-urban sample is very small.

The age-income profile of lawyers in Guanabara (Figure 51) differs from other regions in that it turns down after age sixty.

Agronomy.--The regressions for the sample of Agronomy graduates included in Table 67 show no significant income differences in the variable classes of Sex, Children, Migration and Environment. Protestants earn more than, and "Other Religions" earn less than Roman Catholics and Jews. Whites earn more than mulattoes (only two observations), and Heads of Family earn more than non-Heads of Family. The

TABLE 66

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF GRADUATES OF LAW

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Leg.Inc.	Regression nº 2 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	3227												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	46	0.01425	-0.08733	-0.73522	0.14194	-5.17961	24,305	0.01425	-0.08733	-0.41416	0.13991	-2.96019	29,671
z_9 - 27 " "	355	0.11001	-0.20672	-0.59905	0.05811	-10.30869	27,850	0.11001	-0.20672	-0.36950	0.06011	-6.14736	31,027
z_{10} - 32 " "	507	0.15711	-0.11845	-0.29015	0.05127	-5.65948	37,930	0.15711	-0.11845	-0.20234	0.05017	-4.03289	36,672
z_{11} - 39 " "	1007	Intercept	3.92589				50,698	Intercept	3.80435				44,896
z_{12} - 49 " "	764	0.23675	0.14908	0.24371	0.04517	5.39554	64,690	0.23675	0.14908	0.20344	0.04370	4.65523	55,025
z_{13} - 59 " "	361	0.11187	0.10645	0.27551	0.05775	4.77050	66,780	0.11187	0.10645	0.21402	0.05595	3.82512	55,610
z_{14} - 68 " "	187	0.05795	0.06377	0.23331	0.07497	3.11216	64,020	0.05795	0.06377	0.16460	0.07243	2.27252	52,928
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	3227												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	183							0.05671	-0.17820	-0.32097	0.07439	-4.31482	32,569
z_{26} - Male	3044							Intercept	3.80435				44,896

Head of Family				
z_{27} - Not Head	616		0.19089 -0.27668 0.34335 0.08867 -6.23280	33,148
z_{28} - Head	2811		Intercept 3.80435	44,896
Religion				
z_{29} - Protestant	86		0.02665 0.02540 0.05841 0.09991 0.58648	47,796
z_{30} - Jewish	81		0.02510 -0.01936 -0.07628 0.10273 -0.74249	41,599
z_{31} - Other	395		0.11052 -0.01091 -0.07396 0.05131 -1.44186	41,095
z_{32} - Roman Catholic	2744		Intercept 3.80435	44,896
Race				
z_{33} - Black	13		0.00408 -0.03495 -0.60527 0.25172 -2.40457	23,518
z_{34} - White	3189		Intercept 3.80435	44,896
z_{35} - Other	60		0.01899 -0.07600 -0.44902 0.11880 -3.77950	28,695
Children				
z_{36} - Has Children	2118		0.65614 0.22597 0.23765 0.08436 6.52980	96,988
z_{37} - No Children	1169		Intercept 3.80435	44,896
Class of Activity				
z_{38} - Agriculture	9		0.00279 0.04436 0.77081 0.31172 2.67121	96,995
z_{39} - Extractive	2		0.00062 0.01317 0.34207 0.48348 0.53148	68,287
z_{40} - Mfg. Industry	284		0.06941 0.06090 0.16758 0.09175 1.82696	53,689
z_{41} - Commerce and Transportation	455		0.14100 0.00617 -0.02361 0.07620 -0.31816	43,868
z_{42} - Service Industries	51		0.01580 0.00802 0.05615 0.14020 0.40047	47,489
z_{43} - Government or Other	826		Intercept 3.80435	44,896
z_{44} - Liberal Professions	1400		0.43384 -0.00939 -0.18183 0.07941 -2.28415	37,432
z_{45} - Social Services	260		0.08057 -0.06844 -0.17725 0.06587 -2.70751	37,648
Position				
z_{46} - Public Employee	1099		Intercept 3.80435	44,896
z_{47} - Employer or Own Account	1278		0.39608 0.09873 0.32581 0.07697 4.16169	61,867
z_{48} - Private Employee	844		0.26154 -0.06770 0.04292 0.06859 0.62581	46,865
Migration				
z_{49} - No Migration	1345		0.41680 -0.06573 -0.08197 0.08329 -0.96047	43,488
z_{50} - From Rural	63		0.01952 -0.02772 -0.23125 0.11775 -1.96584	35,620
z_{51} - From Urban	1782		Intercept 3.80435	44,896
Environment				
z_{52} - Urban	1180		Intercept 3.80435	44,896
z_{53} - Suburban	46		0.01425 -0.01608 -0.08473 0.13696 -0.25358	43,348
z_{54} - Rural	1		0.00031 -0.00627 -0.79424 0.90157 -0.88046	28,215
Analysis of Variance				
"F" Value		52.01576	23.58899	
R^2 (R²)		0.08836 (.08695)	0.16998 (.15915)	
Std. Error of Estimate		0.96145	0.90346	

GUANABARA - AGE/INCOME PROFILES - 1960

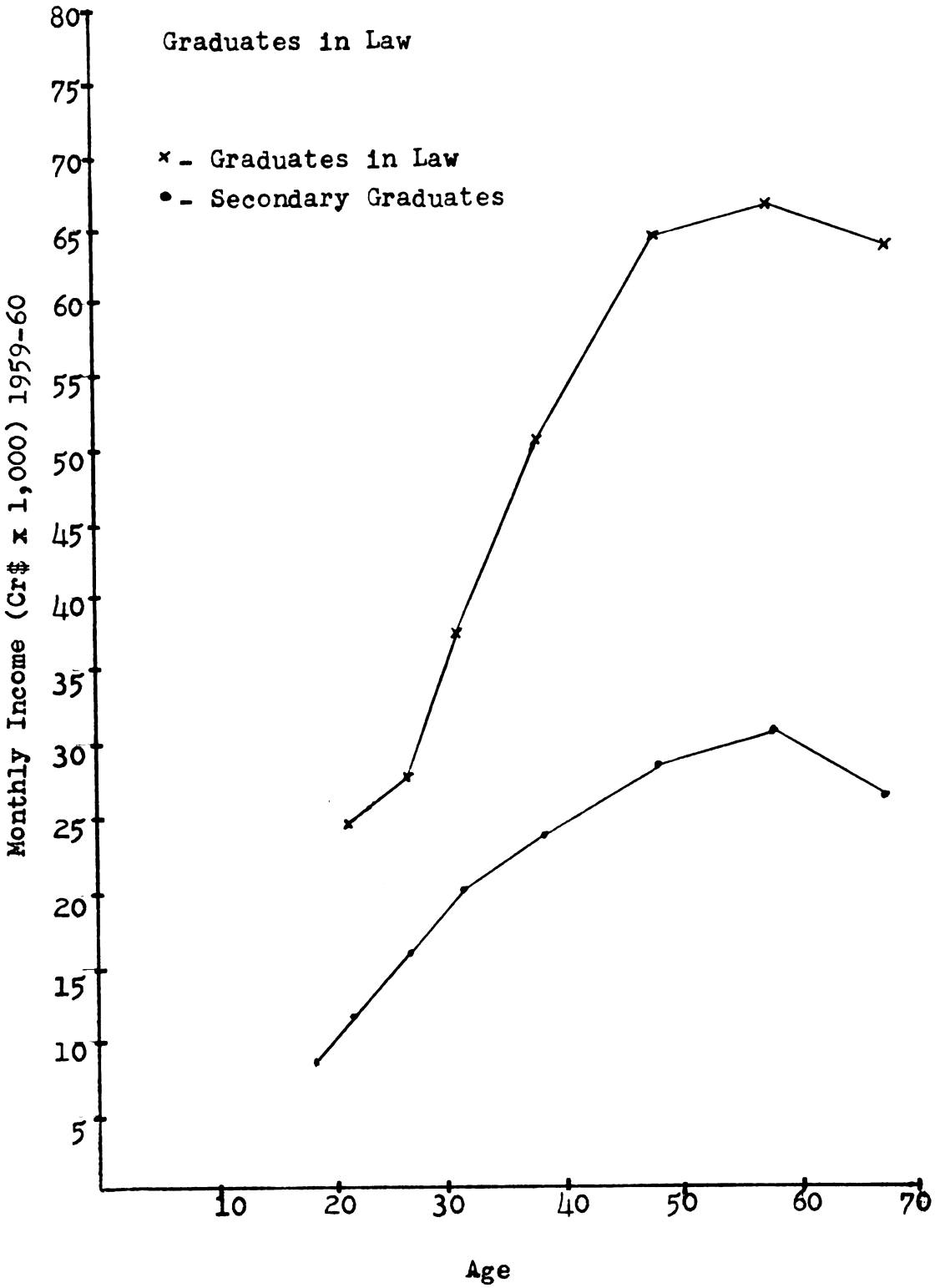


Fig. 51

TABLE 67

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF GRADUATES IN AGRONOMY

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	146												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	2	0.01370	-0.12202	-0.88313	0.60761	-1.45346	15,000	0.01370	-0.12202	-0.97761	0.61737	-1.58352	12,884
z_9 - 27 " "	8	0.05479	-0.07197	-0.24766	0.32151	-0.77029	28,319	0.05479	-0.07197	-0.02003	0.36650	-0.05466	33,567
z_{10} - 32 " "	13	0.08904	-0.03897	-0.09729	0.26324	-0.36959	32,914	0.08904	-0.03897	-0.13109	0.26578	-0.49321	30,039
z_{11} - 39 " "	48	Intercept	3.59118				36,277	Intercept	3.53357				34,246
z_{12} - 49 " "	34	0.23288	-0.07263	-0.10348	0.18872	-0.54833	32,711	0.23288	-0.07263	0.08186	0.18851	0.43422	37,167
z_{13} - 59 " "	30	0.20548	0.26530	0.46043	0.19595	2.34975	57,490	0.20548	0.26530	0.44924	0.19911	2.25623	53,668
z_{14} - 68 " "	11	0.07534	-0.11717	-0.34394	0.28144	-1.22209	25,719	0.07534	-0.11717	-0.12597	0.28528	-0.44158	30,193
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	146												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed	0												
Sex													
z_{25} - Female	7							0.04795	-0.13790	-0.01587	0.38206	-0.04101	33,713
z_{26} - Male	139							Intercept	3.53357				34,246

Head of Family							
z_{27} - Not Head	18		0.1232	-0.1836	-0.5897	0.2505	-2.2707	19,387
z_{28} - Head	128		Intercept 3.5335					34,286
Religion							
z_{29} - Protestant	8		0.0547	0.2303	0.5824	0.3072	1.8958	68,316
z_{30} - Jewish	2		0.0137	0.1127	0.3277	0.5839	0.5012	47,589
z_{31} - Other	13		0.0890	-0.2056	-0.7000	0.2475	-2.8270	17,807
z_{32} - Roman Catholic	123		Intercept 3.5335					34,286
Race							
z_{33} - Black	0							
z_{34} - White	143		Intercept 3.5335					34,286
z_{35} - Other	2		0.0137	-0.1694	-0.9691	0.5963	-1.6252	12,993
Children							
z_{36} - Has Children	107		Intercept 3.5335					34,286
z_{37} - No Children	39		0.2671	-0.0887	-0.0389	0.1719	-2.2269	32,938
Class of Activity							
z_{38} - Agriculture	13		0.0890	0.0096	-0.2154	0.3149	-0.4839	27,609
z_{39} - Extractive	2		0.0137	-0.1070	-1.1271	0.6278	-1.7953	11,094
z_{40} - Mfg. Industry	12		0.0821	0.1120	0.0026	0.3253	0.0081	34,337
z_{41} - Commerce and Transportation	23		0.1575	0.1309	-0.0625	0.2614	-0.2393	32,169
z_{42} - Service Industries	3		0.0205	-0.0551	0.0120	0.5684	0.0219	34,668
z_{43} - Government or Other	73		Intercept 3.5335					34,286
z_{44} - Liberal Professions	13		0.0890	-0.0625	-0.3554	0.3192	-1.1133	21,008
z_{45} - Social Services	7		0.0479	0.0212	0.2416	0.3305	0.7309	43,607
Position							
z_{46} - Public Employee	83		Intercept 3.5335					34,286
z_{47} - Employer or Own Account	24		0.1643	0.1660	0.5375	0.2852	1.8845	58,621
z_{48} - Private Employee	38		0.2602	0.0235	0.3187	0.2579	1.2473	47,103
Migration							
z_{49} - No Migration	41		0.2808	-0.0291	0.1415	0.1565	0.9066	39,458
z_{50} - From Rural	5		0.0342	-0.0470	-0.1865	0.3899	-0.4858	28,819
z_{51} - From Urban	100		Intercept 3.5335					34,286
Environment							
z_{52} - Urban	137		Intercept 3.5335					34,286
z_{53} - Suburban	9		0.0616	-0.1814	-0.4535	0.2909	-1.5580	21,759
z_{54} - Rural	0							
Analysis of Variance								
"F" Value		2.3943			2.1826			
R^2 ($\bar{R}^2$)		0.0930 (.06131)			0.3129 (.17624)			
Std. Error of Estimate		0.8819			0.7891			

GUANABARA - AGE/INCOME PROFILES - 1960

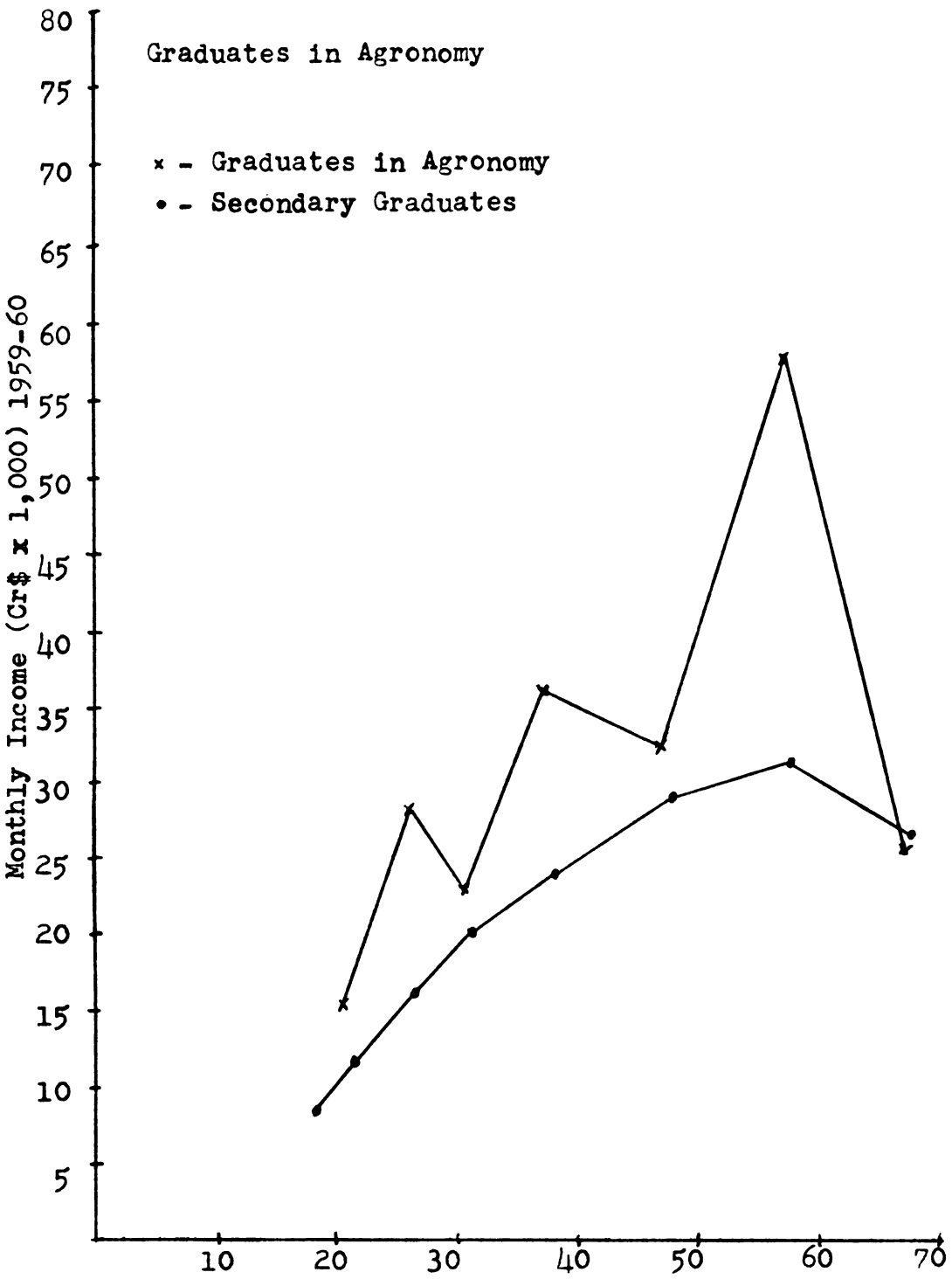


Fig. 52

only significant income difference between Classes of Activity is found in the relatively low income of those in Extractive Industries. The Employer or Self-Employed variable is consistent with higher incomes than Private or Public Employees.

The high income of the age group "55-64 Years," found in Figure 52, is discussed in Chapter IV. The comparatively "rough" age-income profile is probably the result of the small population in this category.

Economic and Political Sciences.--Table 68 contains the log income regressions for graduates in Economic and Political Sciences and the age-income profile for the group is shown in Figure 53. Significantly higher income exists for Males compared to Females, Heads of Family to non-Heads of Family, those with children to those without, and Whites to non-whites. Migration and Environment produce no significant income differences. Public Employees show lower incomes than the other two Position variables. Government Service and Extractive Industry show the highest earnings followed by a group consisting of Manufacturing, Commerce/Transportation, and Social Service; and the lowest group consists of Agriculture, Service Industries, and Liberal Professions.

Other Courses Completed.--Table 69 and Figure 54 contain the results of the regressions using the sample "Other Courses Completed" graduates. Due to the varied

TABLE 68

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF GRADUATES IN ECONOMY

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	654												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	11	0.01682	-0.13323	-1.17157	0.30343	-3.86111	16,858	0.01682	-0.13323	-0.61661	0.29631	-2.08096	28,661
z_9 - 27 " "	98	0.14985	-0.14204	-0.48107	0.11761	-4.09032	33,627	0.14985	-0.14204	-0.28631	0.11290	-2.53601	39,879
z_{10} - 32 " "	122	0.18654	-0.11646	-0.38450	0.10903	-3.52667	37,037	0.18654	-0.11646	-0.30078	0.10198	-2.95061	39,306
z_{11} - 39 " "	246	Intercept 3.99641					54,402	Intercept 3.97216					53,099
z_{12} - 49 " "	116	0.17737	0.10424	0.09021	0.11090	0.81348	59,538	0.17737	0.10424	0.02081	0.10338	0.20125	54,215
z_{13} - 59 " "	49	0.07492	0.09043	0.18488	0.15403	1.20029	65,450	0.07492	0.09043	-0.10717	0.14631	-0.73251	47,703
z_{14} - 68 " "	12	0.01835	-0.01071	-0.21715	0.29108	-0.74601	43,784	0.01835	-0.01071	-0.49798	0.26776	-1.85979	32,271
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	654												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	57							0.08716	-0.25079	-0.71692	0.14567	-3.54877	11,666
z_{26} - Male	597							Intercept 3.97216					53,099

Head of Family							
x_{27} - Not Head	130		0.19078	-0.28035	-0.24376	0.10828	-2.25106	44,683
x_{28} - Head	524		Intercept	3.97216				53,099
Religion							
x_{29} - Protestant	95		0.08410	0.19376	0.59845	0.13500	4.43287	96,628
x_{30} - Jewish	41		0.06269	0.08607	0.14414	0.15153	0.93279	61,332
x_{31} - Other	90		0.13761	-0.01506	0.01612	0.10589	0.15220	53,982
x_{32} - Roman Catholic	408		Intercept	3.97216				53,099
Race							
x_{33} - Black	2		0.00306	-0.06279	-0.60886	0.67378	-0.90365	28,884
x_{34} - White	633		Intercept	3.97216				53,099
x_{35} - Other	18		0.02752	-0.09173	-0.36515	0.21780	-1.07653	36,896
Children							
x_{36} - Has Children	419		Intercept	3.97216				53,099
x_{37} - No Children	235		0.35933	-0.20994	-0.22981	0.07925	-2.89959	42,197
Class of Activity							
x_{38} - Agriculture	2		0.00306	-0.02076	-1.16944	0.65327	-1.79014	16,489
x_{39} - Extractive	4		0.00612	0.07758	0.58855	0.48861	1.25995	95,651
x_{40} - Mfg. Industry	180		0.15291	0.05866	-0.16567	0.14304	-1.15818	44,992
x_{41} - Commerce and Transportation	258		0.38838	0.13674	-0.10273	0.12148	-0.84564	47,915
x_{42} - Service Industries	19		0.02905	-0.01914	-0.42960	0.23332	-1.84124	34,955
x_{43} - Government or Other	129		Intercept	3.97216				53,099
x_{44} - Liberal Professions	82		0.12538	-0.07324	-0.52118	0.15640	-3.33229	31,531
x_{45} - Social Services	64		0.09786	-0.13269	-0.18855	0.14117	-1.05224	45,789
Position							
x_{46} - Public Employee	166		Intercept	3.97216				53,099
x_{47} - Employer or Own Account	145		0.22171	0.22517	0.72107	0.13723	5.25459	109,206
x_{48} - Private Employee	342		0.52294	-0.00808	0.33514	0.11152	3.00527	78,240
Migration							
x_{49} - No Migration	225		0.34404	-0.13210	-0.09572	0.07852	-1.21904	48,252
x_{50} - From Rural	17		0.02599	-0.03142	-0.20022	0.22532	-0.88858	43,468
x_{51} - From Urban	408		Intercept	3.97216				53,099
Environment							
x_{52} - Urban	446		Intercept	3.97216				53,099
x_{53} - Suburban	6		0.00917	-0.01385	-0.27002	0.39200	-0.68884	40,534
x_{54} - Rural	2		0.00306	-0.06279	-0.35320	0.64161	-0.55048	37,299
Analysis of Variance							
"F" Value		8.01308			7.87683		
R^2 ($\bar{R}^2$)		0.06917 (.06200)			0.25958 (.22264)		
Std. Error of Estimate		0.98459			0.89695		

GUANABARA - AGE/INCOME PROFILES - 1960

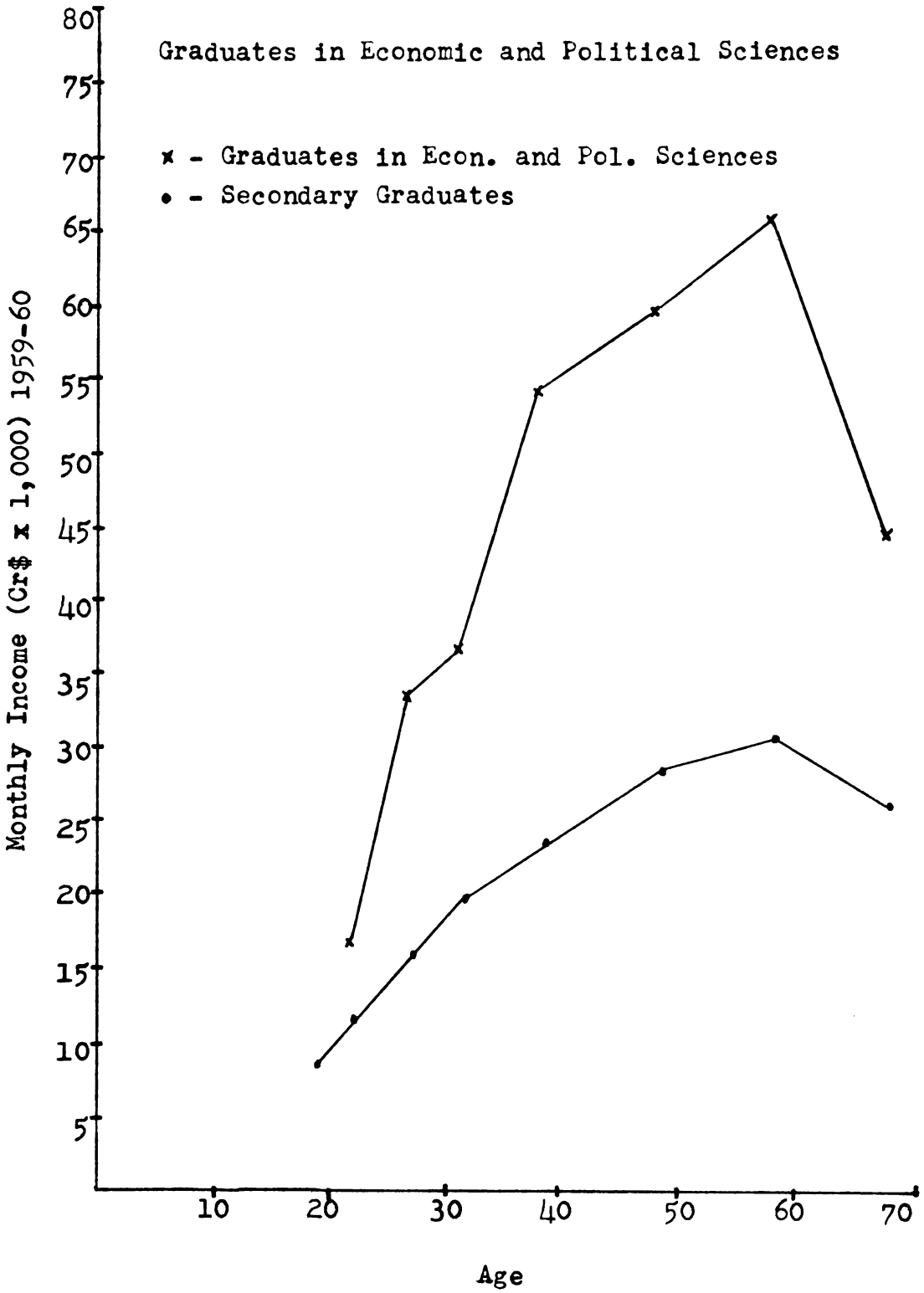


Fig. 53

TABLE 69

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES IN "OTHER COURSES"

Variable Number and Description	Sample Size	Regression nº 1						Regression nº					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	1												
z_2 - 2 years	13												
z_3 - 3 years	2923												
z_4 - 4 years	511												
z_5 - 5 years	161												
z_6 - 6 years	15												
Age													
z_7 - 19 years midpoint	1	Intercept	3.88038				48,443						
z_8 - 22 " "	274	0.07087	-0.15088	-0.55909	0.05743	-9.73476	27,696						
z_9 - 27 " "	580	0.15008	-0.19607	-0.48700	0.04340	-11.22198	29,767						
z_{10} - 32 " "	434	0.14399	-0.08166	-0.23129	0.04214	-5.48916	38,440						
z_{11} - 39 " "	1192	Intercept	3.88038				48,443						
z_{12} - 49 " "	775	0.20047	0.18661	0.27328	0.03955	6.90926	63,667						
z_{13} - 59 " "	329	0.08510	0.12385	0.30353	0.05339	5.68564	65,622						
z_{14} - 68 " "	81	0.02095	0.05451	0.27325	0.09844	2.77592	63,665						
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	3966												
Sex													
z_{25} - Female	337												
z_{26} - Male	3529												

		Head of Family	
z_{27} - Not Head	772		
z_{28} - Head	3094		
		Religion	
z_{29} - Protestant	197		
z_{30} - Jewish	99		
z_{31} - Other	465		
z_{32} - Roman Catholic	3205		
		Race	
z_{33} - Black	21		
z_{34} - White	3752		
z_{35} - Other	88		
		Children	
z_{36} - Has Children	2727		
z_{37} - No Children	1139		
		Class of Activity	
z_{38} - Agriculture	6		
z_{39} - Extractive	7		
z_{40} - Mfg. Industry	292		
z_{41} - Commerce and Transportation	179		
z_{42} - Service Industries	39		
z_{43} - Government or Other	2870		
z_{44} - Liberal Professions	165		
z_{45} - Social Services	368		
		Position	
z_{46} - Public Employee	3067		
z_{47} - Employer or Own Account	219		
z_{48} - Private Employee	577		
		Migration	
z_{49} - No Migration	1831		
z_{50} - From Rural	96		
z_{51} - From Urban	1909		
		Environment	
z_{52} - Urban	3433		
z_{53} - Suburban	228		
z_{54} - Rural	5		
		Analysis of Variance	
"F" Value		76.05366	
R^2 (84)		0.10574 (.10451)	
Std. Error of Estimate		0.85730	

GUANABARA - AGE/INCOME PROFILES - 1960

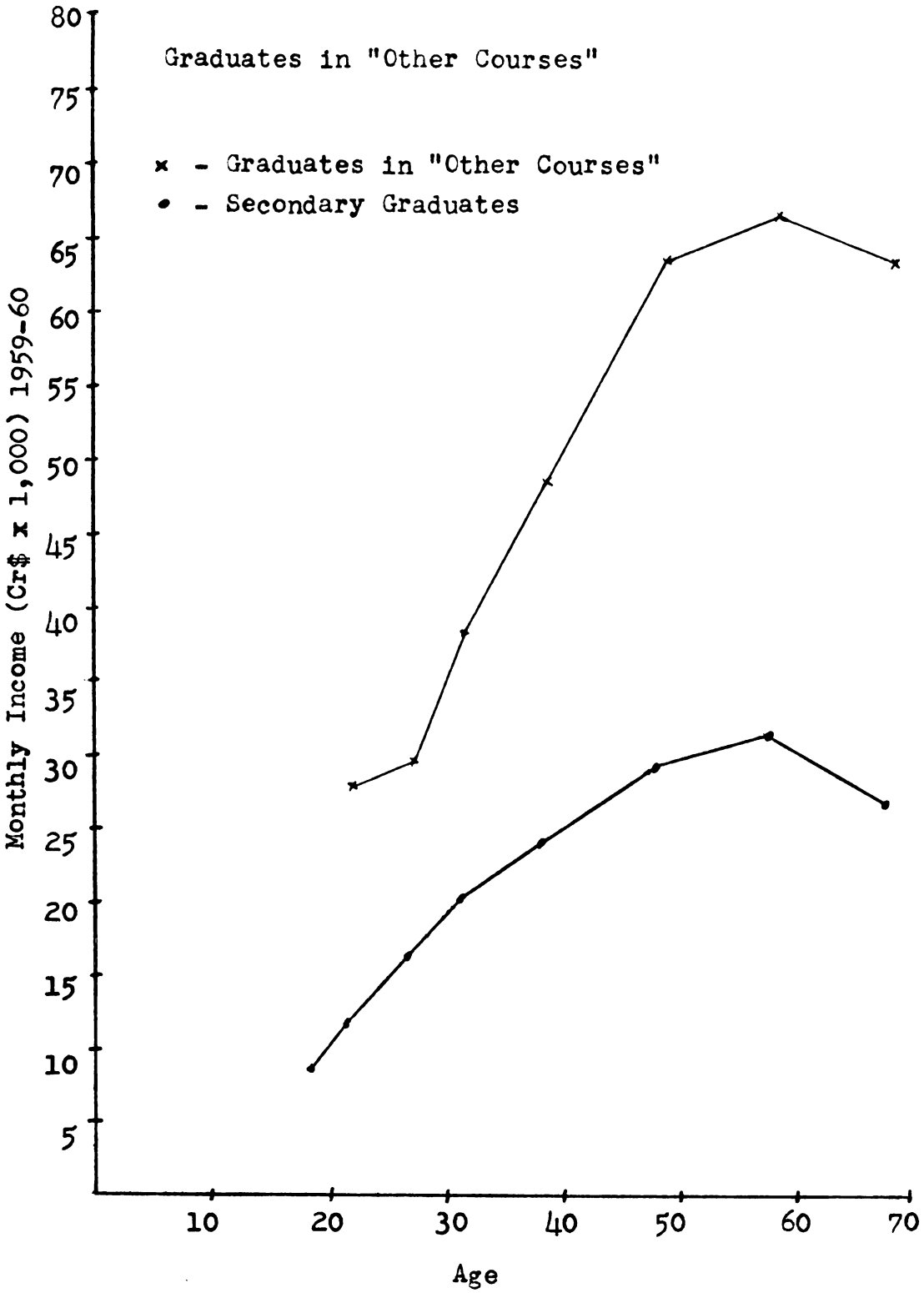


Fig. 54

makeup of this group, no detailed analysis of the results are presented here. Chapter IV contains some general comments on the results of this group.

Studies by Years of University Completed.--Tables 70 through 74 and Figures 55 and 56 contain the results of regressions on sub-samples selected by Years of University Completed. The Six-Years Completed regression is omitted due to its near identity with Medicine graduates. The results are discussed in Chapter IV.

TABLE 70

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
1 YEAR OF UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	406												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	18	0.04444	-0.20761	-1.11673	0.16709	-6.68276	7,702	0.04444	-0.20761	-0.70088	0.19688	-3.52827	11,881
z_8 - 22 " "	119	0.29286	-0.28284	-0.73894	0.10284	-7.17446	11,224	0.29286	-0.28284	-0.28284	0.12827	-2.06106	15,273
z_9 - 27 " "	106	0.26038	-0.26286	-0.26411	0.11066	-2.38688	18,218	0.26038	-0.26286	-0.12600	0.11698	-1.07706	19,028
z_{10} - 32 " "	56	0.13066	0.06746	-0.16673	0.15000	-1.62864	19,490	0.13066	0.06746	-0.11617	0.15663	-0.83288	20,060
z_{11} - 39 " "	65	Intercept	3.15808				22,388	Intercept	3.11688				22,008
z_{12} - 49 " "	26	0.06173	0.23804	0.42174	0.16831	2.50117	26,652	0.06173	0.23804	0.44946	0.16817	2.72834	26,191
z_{13} - 59 " "	13	0.03210	0.25489	0.80686	0.21248	3.79196	28,286	0.03210	0.25489	0.80610	0.20644	3.58961	30,684
z_{14} - 68 " "	7	0.01726	0.10044	0.28918	0.27845	1.03851	31,228	0.01726	0.10044	0.11734	0.28119	0.41726	26,423
Course Completed													
z_{15} - Secondary	404							Intercept	3.11688				22,008
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - [illegible]	0												
z_{22} - Agronomy	1												
z_{23} - Econ./Fol. Science	0												
z_{24} - All other courses completed except Seminary	1							0.00247	0.04406	-0.07684	0.69978	-0.98409	11,515
Sex													
z_{25} - Female	64							0.15888	-0.19681	-0.14896	0.11110	-1.33968	19,497
z_{26} - Male	341							Intercept	3.11688				22,008

Head of Family								
z_{27} - Not Head	994		0.50970	-0.42670	-0.97120	0.09754	-0.16288	27,995
z_{28} - Head	991		Intercept	2.11988				28,000
Religion								
z_{29} - Protestant	18		0.09704	0.09697	0.09697	0.18969	0.18969	28,189
z_{30} - Jewish	8		0.01978	-0.01788	0.17269	0.84268	0.70978	28,979
z_{31} - Other	88		0.18969	0.04104	0.09216	0.16141	0.89888	28,139
z_{32} - Roman Catholic	287		Intercept	2.11988				28,000
Race								
z_{33} - Black	6		0.01481	-0.07008	-0.89289	0.08864	-1.89281	18,897
z_{34} - White	971		Intercept	2.11988				28,000
z_{35} - Other	97		0.08667	-0.05178	-0.88888	0.15798	-1.88888	27,949
Children								
z_{36} - Has Children	141		0.84818	0.41068	0.81875	0.89898	9.89899	28,189
z_{37} - No Children	884		Intercept	2.11988				28,000
Class of Activity								
z_{38} - Agriculture	8		0.00484	0.08888	-0.87849	0.81948	-0.88884	27,167
z_{39} - Extractive	5		0.00741	0.08701	0.81878	0.49948	0.78869	28,989
z_{40} - Mfg. Industry	68		0.18948	0.18186	0.09788	0.18948	0.84888	24,884
z_{41} - Commerce and Transportation	187		0.82887	0.09280	-0.01499	0.18889	-0.18884	28,884
z_{42} - Service Industries	28		0.08810	0.00488	-0.88881	0.88888	-1.88118	27,489
z_{43} - Government or Other	91		Intercept	2.11988				28,000
z_{44} - Liberal Professions	89		0.07407	-0.12888	-0.88889	0.17887	-1.89788	27,989
z_{45} - Social Services	64		0.18808	-0.12946	-0.08889	0.12488	-0.72897	28,048
Position								
z_{46} - Public Employee	128		Intercept	2.11988				28,000
z_{47} - Employer or Own Account	65		0.10617	0.18974	0.18889	0.18976	0.98788	28,697
z_{48} - Private Employee	282		0.84818	0.01807	0.10088	0.11886	0.88867	28,697
Migration								
z_{49} - No Migration	287		0.81111	-0.19048	-0.10644	0.07180	-0.88488	28,148
z_{50} - From Rural	18		0.08810	-0.01107	-0.10888	0.88849	-0.88887	28,817
z_{51} - From Urban	188		Intercept	2.11988				28,000
Environment								
z_{52} - Urban	289		Intercept	2.11988				28,000
z_{53} - Suburban	14		0.03457	-0.03880	-0.12880	0.18880	-0.71219	18,787
z_{54} - Rural	1		0.00847	0.04486	-0.88848	0.72081	-0.88448	28,884
Analysis of Variance								
"F" Value		20.96818				7.84726		
R^2 ($\bar{R}^2$)		.88888 (.25880)				.88884 (.33440)		
Std. Error of Estimate		0.70844				0.88888		

TABLE 7/

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
8 YEARS OF UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	446												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	0												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	1	0.00224	-0.04769	-1.15109	0.74318	-1.54900	8,000	0.00224	-0.04769	-1.20775	0.78345	-1.66944	8,886
x_8 - 22 " "	117	0.26233	-0.40414	-0.87267	0.10601	-8.23462	10,541	0.26233	-0.40414	-0.80726	0.19460	-4.07580	11,786
x_9 - 27 " "	109	0.24439	-0.07895	-0.41516	0.10761	-3.85795	12,669	0.24439	-0.07895	-0.21965	0.10660	-2.01990	13,678
x_{10} - 32 " "	69	0.15471	0.00814	-0.12953	0.13034	-1.01318	22,376	0.15471	0.00814	0.03771	0.11366	0.33143	20,007
x_{11} - 39 " "	65	Intercept		2.88065			25,292	Intercept		2.97188			19,489
x_{12} - 49 " "	49	0.08969	0.21572	0.89306	0.14218	2.06755	33,937	0.08969	0.21572	0.12648	0.13718	1.11156	22,748
x_{13} - 59 " "	23	0.05157	0.18963	0.88908	0.17406	2.93689	37,323	0.05157	0.18963	0.22906	0.16719	1.37541	24,578
x_{14} - 68 " "	4	0.00897	0.14570	0.98448	0.37814	2.60349	67,066	0.00897	0.14570	0.77084	0.40665	1.89747	48,187
Course Completed													
x_{15} - Secondary	435							Intercept		2.97188			19,489
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	18							0.03213	0.03269	0.61744	0.32167	1.92023	29,646
Sex													
x_{25} - Female	72							0.17489	-0.09284	-0.21771	0.09709	-2.24277	15,448
x_{26} - Male	388							Intercept		2.97188			19,489

Head of Family			
x_{27} - Not Head	206		0.42946 -0.42966 -0.20497 0.00000 -0.00000 14,949
x_{28} - Head	229		Intercept 2.97188 20,000
Religion			
x_{29} - Protestant	16		0.00567 -0.01778 0.21061 0.17969 1.17188 24,397
x_{30} - Jewish	15		0.00369 0.00048 0.40897 0.15969 2.67041 21,048
x_{31} - Other	24		0.15186 0.15416 0.25978 0.15129 2.67969 22,025
x_{32} - Roman Catholic	202		Intercept 2.97188 20,000
Race			
x_{33} - Black	2		0.00448 -0.00681 0.17897 0.46994 0.00000 20,048
x_{34} - White	427		Intercept 2.97188 20,000
x_{35} - Other	26		0.00000 -0.00697 -0.16018 0.14189 -1.14189 20,000
Children			
x_{36} - Has Children	188		0.41480 0.39986 0.18488 0.00000 2.18881 20,497
x_{37} - No Children	241		Intercept 2.97188 20,000
Class of Activity			
x_{38} - Agriculture	1		0.00144 0.00478 -1.14878 0.79814 -1.69748 0.181
x_{39} - Extractive	2		0.00448 0.01570 -0.00096 0.00455 -0.00284 18,976
x_{40} - Mfg. Industry	65		0.14186 0.00367 0.00000 0.14178 0.00100 20,000
x_{41} - Commerce and Transportation	100		0.97000 0.80116 0.07978 0.12837 0.00004 21,004
x_{42} - Service Industries	18		0.04036 0.00408 -0.14684 0.00000 -0.71000 16,000
x_{43} - Government or Other	100		Intercept 2.97188 20,000
x_{44} - Liberal Professions	39		0.00726 -0.12004 -0.02648 0.17000 -1.00000 18,436
x_{45} - Social Services	65		0.14186 -0.12304 -0.07000 0.11881 -0.00000 18,000
Position			
x_{46} - Public Employee	100		Intercept 2.97188 20,000
x_{47} - Employer or Own Account	45		0.10814 0.00210 0.00000 0.14778 0.00007 20,000
x_{48} - Private Employee	240		0.54000 0.00974 0.00007 0.10000 0.00041 22,977
Migration			
x_{49} - No Migration	204		0.00284 -0.10040 -0.07006 0.07001 -1.00014 20,101
x_{50} - From Rural	20		0.04038 0.00047 -0.00174 0.15000 -0.01000 18,405
x_{51} - From Urban	197		Intercept 2.97188 20,000
Environment			
x_{52} - Urban	407		Intercept 2.97188 20,000
x_{53} - Suburban	18		0.04036 -0.07188 -0.07007 0.16007 -1.00700 14,000
x_{54} - Rural	1		0.00284 -0.04700 -0.00000 0.71797 -0.00000 0.705
Analysis of Variance			
"F" Value		21.51000	0.00000
R^2 (R^2)		.00000 (.24567)	.40007 (.36876)
Std. Error of Estimate		0.72000	0.07477

TABLE 72.

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
8 YEARS OF UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	2,778												
z_4 - 4 years	0												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	389	0.08978	-0.20701	-0.71871	0.08304	-13.86188	88,265	0.08978	-0.20701	-0.20920	0.08436	-0.26630	30,821
z_9 - 27 " "	877	0.15861	-0.20047	-0.54554	0.04377	-12.46516	86,861	0.15861	-0.20047	-0.20254	0.04150	-0.45848	23,061
z_{10} - 32 " "	698	0.15896	-0.08883	-0.26260	0.04288	-6.09806	54,854	0.15896	-0.08883	-0.12574	0.03781	-4.26903	26,358
z_{11} - 39 " "	1,284	Intercept	3.28612				45,854	Intercept	3.53067				34,147
z_{12} - 49 " "	688	0.18280	0.20745	0.29804	0.04126	7.20765	61,814	0.18280	0.20745	0.26345	0.03667	7.14688	44,439
z_{13} - 59 " "	328	0.07998	-0.14749	-0.25484	0.05849	-4.36380	65,386	0.07998	-0.14749	-0.21304	0.04965	-4.30640	40,998
z_{14} - 68 " "	78	0.03066	0.06105	0.21648	0.10044	2.15509	54,973	0.03066	0.06105	0.19776	0.09947	2.21048	41,615
Course Completed													
z_{15} - Secondary	447							Intercept	3.53067				34,147
z_{16} - Philosophy	119							0.02161	-0.09635	0.26721	0.06149	2.78818	48,897
z_{17} - Medicine	0												
z_{18} - Pharmacy	98							0.02426	-0.07269	-0.26429	0.06245	-0.26349	38,996
z_{19} - Dentistry	196							0.04164	-0.06289	0.09574	0.06188	1.06289	37,315
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	2,023							0.77419	0.28461	0.49239	0.04289	8.89121	58,469
Sex													
z_{25} - Female	396							0.10697	-0.27266	-0.86973	0.08897	-10.86979	19,461
z_{26} - Male	2,389							Intercept	3.53067				34,147
Head of Family													
z_{27} - Not Head	866							0.22838	-0.24178	-0.19886	0.02718	-5.28118	30,106
z_{28} - Head	2,911							Intercept	3.53067				34,147

Religion				
x_{29} - Protestant	286		0.00897 0.00804 0.01100 0.00906 0.74818	24,000
x_{30} - Jewish	28		0.00065 -0.01514 0.10475 0.15908 0.00668	27,917
x_{31} - Other	436		0.11017 0.01089 0.00648 0.00908 0.16164	24,008
x_{32} - Roman Catholic	2,288		Intercept 2.52907	24,167
Race				
x_{33} - Black	20		0.00206 -0.00181 -0.00089 0.17841 -0.00081	20,000
x_{34} - White	2,649		Intercept 2.52907	24,167
x_{35} - Other	286		0.08728 -0.00481 -0.24989 0.07948 -4.00089	24,078
Children				
x_{36} - Has Children	2,889		0.00286 0.00008 0.00010 0.00188 2.00000	27,441
x_{37} - No Children	1,186		Intercept 2.52907	24,167
Class of Activity				
x_{38} - Agriculture	8		0.00128 -0.00878 -1.00001 0.24788 -0.00078	20,000
x_{39} - Extractive	4		0.00106 0.00217 -0.02816 0.09712 -0.00284	27,694
x_{40} - Mfg. Industry	189		0.00416 -0.00080 -0.00188 0.00818 -0.00000	24,000
x_{41} - Commerce and Transportation	206		0.07838 -0.07848 -0.00086 0.07804 -0.70000	24,008
x_{42} - Service Industries	48		0.01089 -0.00877 -0.40086 0.18471 -0.00814	22,678
x_{43} - Government or Other	2,707		Intercept 2.52907	24,167
x_{44} - Liberal Professions	270		0.04808 -0.10707 -0.00015 0.10288 -4.00008	22,789
x_{45} - Social Services	248		0.09197 -0.20884 -0.08718 0.08800 -7.00000	21,817
Position				
x_{46} - Public Employee	2,628		Intercept 2.52907	24,167
x_{47} - Employer or Own Account . .	248		0.06409 -0.03848 0.20888 0.08778 2.00788	48,888
x_{48} - Private Employee	286		0.12881 -0.18748 0.14087 0.08884 2.41088	20,888
Migration				
x_{49} - No Migration	1,788		0.46845 -0.08848 0.01888 0.08804 0.00078	24,088
x_{50} - From Rural	288		0.08648 -0.08888 -0.17884 0.07848 -0.84887	28,088
x_{51} - From Urban	1,888		Intercept 2.52907	24,167
Environment				
x_{52} - Urban	2,887		Intercept 2.52907	24,167
x_{53} - Suburban	288		0.06880 -0.01818 -0.08184 0.08888 -0.97881	28,088
x_{54} - Rural	8		0.00079 -0.01888 -0.88781 0.44018 -0.87814	28,887
Analysis of Variance				
"F" Value		108.16841	68.88888	
R^2 (R^2)		.14186 (.13993)	.88888 (.31600)	
Std. Error of Estimate . . .		0.88869	0.78888	

GUANABARA - AGE/INCOME PROFILES - 1960

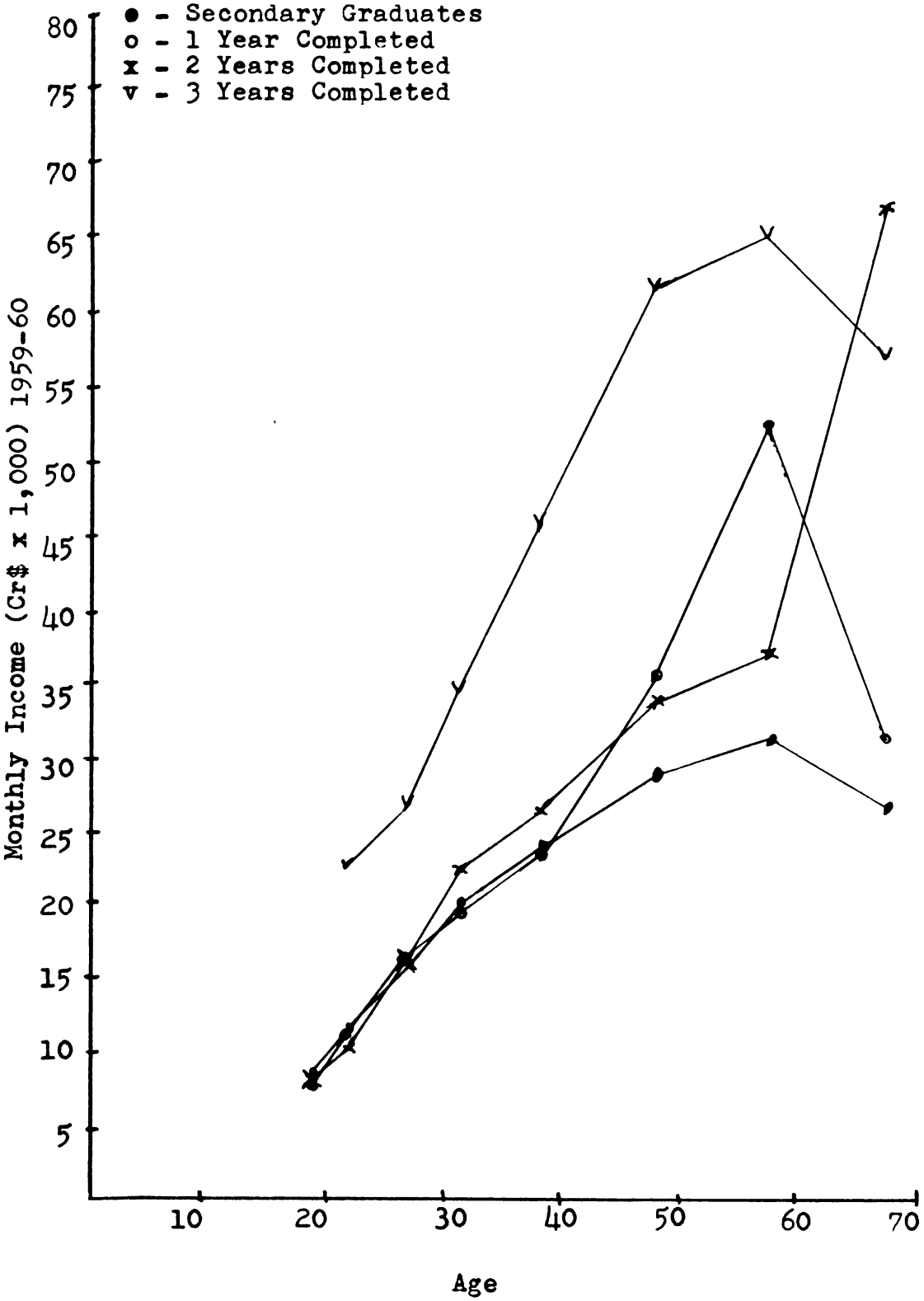


Fig. 55

TABLE 73

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
4 YEARS OF UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Regression nº 2 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	3,005												
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	167	0.04534	-0.17140	-0.80886	0.07673	-12.13589	14,586	0.04534	-0.17140	-0.80787	0.07288	-6.97004	17,970
z_9 - 27 " "	800	0.18080	-0.17948	-0.85333	0.04893	-12.04645	20,774	0.18080	-0.17948	-0.85389	0.04444	-7.94955	20,974
z_{10} - 32 " "	668	0.12686	-0.06388	-0.99184	0.04979	-6.65086	26,906	0.12686	-0.06338	-0.15101	0.04040	-4.48044	24,917
z_{11} - 39 " "	1,097	Intercept	3.58708				36,156	Intercept	3.29656				29,661
z_{12} - 49 " "	684	0.18978	0.14178	0.11867	0.04885	2.57044	40,435	0.18972	0.14178	0.03890	0.04037	0.96375	31,046
z_{13} - 59 " "	296	0.08906	0.06686	0.02481	0.05862	0.61133	37,269	0.08906	0.06686	-0.09089	0.05849	-1.78044	27,965
z_{14} - 68 " "	151	0.03857	-0.00417	-0.18709	0.06217	-8.84961	29,968	0.03857	-0.00417	-0.87591	0.07863	-8.60488	22,661
Course Completed													
z_{15} - Secondary	228							Intercept	3.29655				29,661
z_{16} - Philosophy	1,121							0.20457	-0.13547	0.06571	0.04651	4.07243	38,639
z_{17} - Medicine	0												
z_{18} - Pharmacy	226							0.05189	-0.06071	-0.01595	0.07968	-0.20046	29,396
z_{19} - Dentistry	204							0.21250	-0.06965	0.11290	0.04956	1.64978	35,430
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	148							0.08964	0.05908	0.21288	0.09098	2.40648	37,166
z_{23} - Econ./Pol. Science	664							0.17787	0.21648	0.28008	0.04906	7.08844	49,226
z_{24} - All other courses completed except Seminary	211							0.12978	0.08847	0.21806	0.08721	4.87990	40,918
Sex													
z_{25} - Female	870							0.28888	-0.28864	-0.28717	0.04184	-7.44796	21,965
z_{26} - Male	2,815							Intercept	3.29656				29,661

Head of Family			
x_{27} - Not Head	1,108		0.00000 -0.00000 0.00000 0.00000 -0.00000 [illegible]
x_{28} - Head	2,000		Intercept 0.00000 [illegible]
Religion			
x_{29} - Protestant	884		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
x_{30} - Jewish	178		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
x_{31} - Other	482		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
x_{32} - Roman Catholic	2,750		Intercept 0.00000 [illegible]
Race			
x_{33} - Black	82		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
x_{34} - White	3,207		Intercept 0.00000 [illegible]
x_{35} - Other	89		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
Children			
x_{36} - Has Children	2,816		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
x_{37} - No Children	1,487		Intercept 0.00000 [illegible]
Class of Activity			
x_{38} - Agriculture	18		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
x_{39} - Extractive	18		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
x_{40} - Mfg. Industry	600		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
x_{41} - Commerce and Transportation	288		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
x_{42} - Service Industries	78		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
x_{43} - Government or Other	287		Intercept 0.00000 [illegible]
x_{44} - Liberal Professions	728		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
x_{45} - Social Services	1,144		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
Position			
x_{46} - Public Employee	1,888		Intercept 0.00000 [illegible]
x_{47} - Employer or Own Account	921		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
x_{48} - Private Employee	1,000		0.00000 0.00000 0.00000 0.00000 0.00000 [illegible]
Migration			
x_{49} - No Migration	1,887		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
x_{50} - From Rural	284		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
x_{51} - From Urban	1,041		Intercept 0.00000 [illegible]
Environment			
x_{52} - Urban	2,842		Intercept 0.00000 [illegible]
x_{53} - Suburban	94		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
x_{54} - Rural	8		0.00000 -0.00000 -0.00000 0.00000 -0.00000 [illegible]
Analysis of Variance			
"F" Value		00.00000	00.00000
R^2 ($\bar{R}^2$)		.00000 (.00000)	.00000 (.00000)
Std. Error of Estimate		0.00000	0.00000

TABLE 74

STATE OF GUANABARA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
FIVE YEARS UNIVERSITY COMPLETED

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	0												
z_4 - 4 years	0												
z_5 - 5 years	5829												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	107	0.01836	-0.08405	-0.08269	0.09475	-7.20182	29,292	0.01836	-0.08086	-0.34665	0.09341	-3.87167	19,718
z_9 - 27 " "	706	0.12112	-0.19967	-0.60710	0.04250	-14.28588	31,592	0.12118	-0.19967	-0.28231	0.04253	-6.77946	18,785
z_{10} - 32 " "	1000	0.17156	-0.08202	-0.25493	0.03781	-6.74312	44,928	0.17156	-0.08404	-0.19800	0.03620	-5.29668	22,630
z_{11} - 39 " "	1924	Intercept	4.05999				57,974	Intercept	3.51818				37,267
z_{12} - 49 " "	1274	0.21856	0.11177	0.13068	0.03514	3.71909	66,067	0.21856	0.11177	0.09886	0.03344	2.94726	30,379
z_{13} - 59 " "	718	0.12318	0.09934	0.18355	0.04224	4.34509	69,654	0.12318	0.09934	0.10883	0.04026	2.60882	30,988
z_{14} - 68 " "	300	0.05147	0.02376	0.02299	0.05950	0.38647	59,322	0.05147	0.02376	-0.04726	0.05663	-0.83468	26,286
Course Completed													
z_{15} - Secondary	50							Intercept	3.51818				37,267
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	2191							0.37888	0.14888	0.70079	0.12188	5.38080	88,979
z_{21} - Law	3227							0.55351	-0.08886	0.80086	0.12407	5.81881	48,648
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	341							0.051188	-0.078878	0.338487	0.12884	2.77844	40,488
Sex													
z_{25} - Female	252							0.04288	-0.12886	-0.281187	0.08218	-3.4088	18,618
z_{26} - Male	5577							Intercept	3.51818				37,267

Head of Family			
x_{27} - Not Head	1048		0.10286 -0.00000 -0.00715 0.00004 -0.04000 20,000
x_{28} - Head	4766		Intercept 3.222510 27,287
Religion			
x_{29} - Protestant	281		0.04821 0.07022 0.18146 0.00004 3.21020 20,004
x_{30} - Jewish	245		0.04003 -0.04211 -0.00013 0.00002 -1.00000 20,004
x_{31} - Other	692		0.11185 -0.00021 -0.00049 0.00704 -0.07702 20,000
x_{32} - Roman Catholic	4651		Intercept 3.222510 27,287
Race			
x_{33} - Black	22		0.00377 -0.04270 -0.00004 0.10004 -0.00400 20,770
x_{34} - White	5092		Intercept 3.222510 27,287
x_{35} - Other	106		0.01210 -0.00007 -0.00040 0.00070 -0.04070 20,700
Children			
x_{36} - Has Children	3842		0.00022 0.00407 0.10006 0.00720 0.00001 20,000
x_{37} - No Children	1907		Intercept 3.222510 27,287
Class of Activity			
x_{38} - Agriculture	22		0.00377 0.04270 0.07000 0.00001 2.74000 40,004
x_{39} - Extractive	34		0.00005 0.00400 0.00017 0.10200 0.00100 20,000
x_{40} - Mfg. Industry	1017		0.17447 0.00004 0.07400 0.00040 1.00000 20,000
x_{41} - Commerce and Transportation	701		0.12000 0.00000 0.01000 0.00400 0.04110 27,000
x_{42} - Service Industries	82		0.01407 -0.01974 -0.10407 0.10000 -1.70000 20,000
x_{43} - Government or Other	1245		Intercept 3.222510 27,287
x_{44} - Liberal Professions	2233		0.00000 0.00000 -0.11100 0.00011 -1.00100 24,000
x_{45} - Social Services	415		0.07100 -0.00000 -0.10001 0.00100 -0.00000 20,000
Position			
x_{46} - Public Employee	1759		Intercept 3.222510 27,287
x_{47} - Employer or Own Account . .	1983		0.04000 0.12004 0.00070 0.00207 0.00001 20,044
x_{48} - Private Employee	2077		0.00430 -0.01000 0.10000 0.04707 2.00000 21,000
Migration			
x_{49} - No Migration	2353		0.02007 -0.00000 -0.02020 0.00404 -0.70001 27,007
x_{50} - From Rural	105		0.01001 -0.00001 -0.10405 0.00000 -1.01407 20,040
x_{51} - From Urban	3313		Intercept 3.222510 27,287
Environment			
x_{52} - Urban	5737		Intercept 3.222510 7,000
x_{53} - Suburban	85		0.01400 -0.00004 -0.00006 0.10010 -0.00000 20,001
x_{54} - Rural	7		0.00100 -0.00000 -1.00010 0.00070 -0.00000 7,000
Analysis of Variance			
"F" Value		71.16053	20.72000
R^2 ($\bar{R}^2$)		0.06832 (.06753)	.17000 (.16639)
Std. Error of Estimate . . .		0.95107	0.00000

GUANABARA - AGE/INCOME PROFILES - 1960

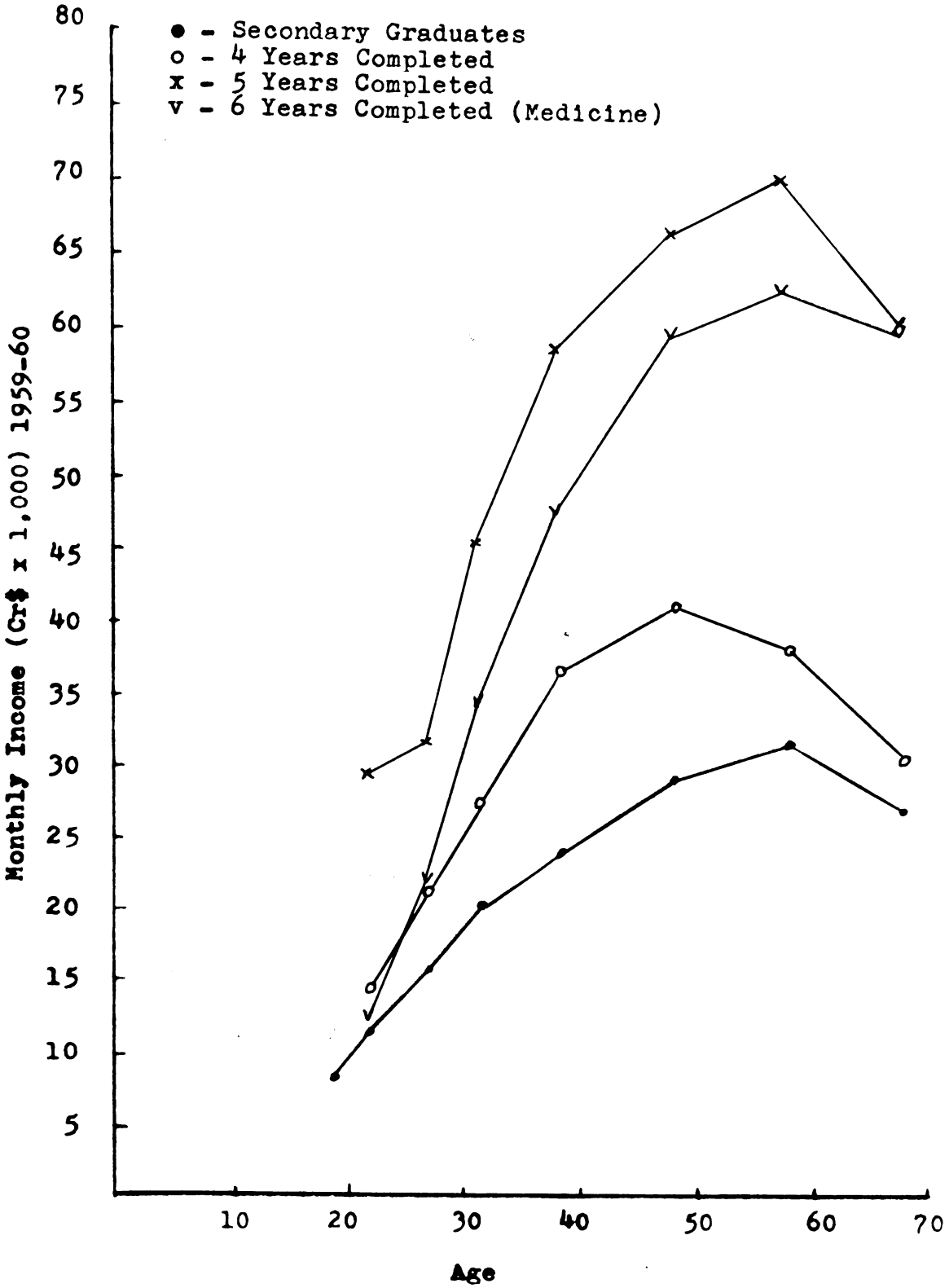


Fig. 56

THE SANTA CATARINA STUDY

Table 75 shows the number of persons in the total population of Santa Catarina at the time of the 1960 Census who had completed the secondary level. Column (4) shows the number of employed persons in my sample. Column (5) gives the percentage of the total populations represented by the samples for each university group and also the secondary graduates. As with the other areas sutdied, the aggregate figures are close to the twenty-five percent sampling ideal with a somewhat larger representation among the secondary graduates. Table 76 lists the sub-samples on which regressions were performed, the variable key, and the size of each cell of observations.

Table 77 contains the regression results for the total sample including both university and secondary graduates. Although there is a trend toward higher earnings with increased years of education (university), it is not uniformly step-wise for each year of university completed. When all variables are included in a single regression, a total of forty-seven percent of lon income variance is explained. The influence of each class of variables is discussed below in connection with the several stratified sub-samples.

All University Graduates.--Table 78 and Figure 57 contain the regressions of long income on the different classes

TABLE 75

SANTA CATARINA
POPULATION AND SAMPLE COMPOSITION

Census Code (1)	Course (2)	Total Pop.[b] (3)	Employed Sample[c] (4)	(4) as Percent of (3) (5)
50-54	Philosophy	387	52	13.4
60	Medicine	421	136	32.3
61	Pharmacy	280	67	23.9
62	Dentistry	335	103	30.7
64	Engineering	391	119	30.4
67	Law	814	230	28.3
68	Agronomy	139	41	29.5
70	Economic and Political Sciences	224	76	33.9
	"Other Courses"			
	Architecture	42		
	Domestic Arts	1		
	Fine Arts	4		
	Statistics	7		
	Seminary[a]	364		
	Physical Education	3		
	Military	209		
	Industrial Chemistry	67		
	Sanitary Services	6		
	Veterinary	66		
	"Other Courses" Total	769	133	17.3
	Grand Totals	3,760	957	25.5
	Secondary Graduates	8,654	1,760	20.3

[a]Not included in study.

[b]Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, Censo Demográfico de 1960. (Rio de Janeiro: 1967)

[c]Brazil, Fundação IBGE - Instituto Brasileiro de Estatística, Serviço Nacional de Recenseamento, VII Recenseamento Geral do Brasil 1960, 25 Percent Sample.

TABLE 76

VARIABLE KEY AND SAMPLE COMPOSITION

STATE OF SANTA CATARINA - 1960 CENSUS DATA

Variable Number and Description	SAMPLE COMPOSITION																	
	Total	Total Univ.	Total second.	1 yr. univ.	2 yrs. univ.	3 yrs. univ.	4 yrs. univ.	5 yrs. univ.	6 yrs. univ.	Phil.	Medic.	Pharm.	Dent.	Engin.	Law	Agron.	Econ. Pol.Sc.	Other Univ. Courses
Years of University Completed																		
X1 - 1 year	27	0	27	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0
X2 - 2 years	22	0	22	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0
X3 - 3 years	187	161	26	0	0	187	0	0	0	0	0	0	0	0	0	0	0	73
X4 - 4 years	303	289	14	0	0	0	303	0	0	47	0	34	49	0	0	41	76	56
X5 - 5 years	370	365	5	0	0	0	0	370	0	0	0	0	0	116	230	0	0	16
X6 - 6 years	136	136	0	0	0	0	0	0	136	0	136	0	0	0	0	0	0	0
Age																		
X7 - 19 years midpoint	68	1	61	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1
X8 - 22 " "	214	39	175	6	10	27	12	11	1	3	1	3	5	4	2	1	2	14
X9 - 27 " "	648	198	467	6	7	54	58	68	19	7	19	30	26	15	45	7	16	23
X10 - 32 " "	804	338	466	8	1	39	81	96	31	10	31	11	23	29	63	13	25	33
X11 - 38 " "	536	248	288	4	3	29	79	102	45	9	43	11	19	27	72	12	23	32
X12 - 43 " "	373	156	117	0	1	27	45	60	25	15	25	14	17	21	36	2	6	30
X13 - 48 " "	131	61	70	1	0	6	24	21	11	6	11	2	6	15	6	6	2	7
X14 - 55 " "	48	22	16	0	0	3	7	15	6	2	6	4	3	10	3	0	1	2
Courses Completed																		
X15 - Secondary	1760	0	1760	27	22	26	14	8	0	0	0	0	0	0	0	0	0	0
X16 - Philosophy	52	52	0	0	0	5	47	0	0	52	0	0	0	0	0	0	0	0
X17 - Medicine	136	136	0	0	0	0	0	0	136	0	136	0	0	0	0	0	0	0
X18 - Pharmacy	67	67	0	0	0	34	33	0	0	0	0	67	0	0	0	0	0	0
X19 - Dentistry	103	103	0	0	0	49	54	0	0	0	0	0	103	0	0	0	0	0
X20 - Engineering	119	119	0	0	0	0	0	119	0	0	0	0	0	119	0	0	0	0
X21 - Law	230	230	0	0	0	0	0	230	0	0	0	0	0	0	230	0	0	0
X22 - Agronomy	41	41	0	0	0	0	41	0	0	0	0	0	0	0	0	41	0	0
X23 - Econ./Pol. Science	76	76	0	0	0	0	76	0	0	0	0	0	0	0	0	0	76	0
X24 - All other courses completed except Seminary	135	135	0	0	0	75	32	16	0	0	0	0	0	0	0	0	0	135
Sex																		
X25 - Female	823	49	774	4	8	14	22	17	0	10	0	8	3	1	15	1	2	8
X26 - Male	3094	900	1186	23	17	178	281	383	136	48	136	59	100	118	215	40	73	128
Head of Family																		
X27 - Not Head	949	151	818	9	11	48	44	54	8	13	8	13	19	12	26	4	7	21
X28 - Head	2774	886	948	18	11	145	259	346	128	45	128	53	84	107	194	37	68	115

Religion																		
X29- Protestant	362	181	221	3	1	21	56	47	11	6	11	12	23	21	12	6	15	15
X30- Jewish	7	3	4	0	0	1	1	0	1	0	1	2	0	0	0	0	0	0
X31- Other	160	79	81	1	4	20	24	28	8	3	8	6	9	8	10	3	7	16
X32- Roman Catholic	2150	744	1444	23	17	145	222	295	116	43	116	47	72	80	190	28	54	109
Race																		
X33- Black	14	1	13	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0
X34- White	2897	955	1742	27	22	197	300	370	126	50	126	67	103	110	220	41	76	126
X35- Other	8	1	5	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Children																		
X36- Has Children	1647	703	944	12	8	115	216	284	106	23	108	49	71	90	178	31	61	98
X37- No Children	1070	254	816	15	17	78	87	86	38	29	28	18	38	29	52	10	15	41
Class of Activity																		
X38- Agriculture	40	10	30	2	0	2	2	1	0	0	0	0	0	1	0	0	0	2
X39- Extractive	48	14	34	0	0	1	7	0	1	0	1	0	1	2	1	0	2	1
X40- Mfg. Industry	267	91	176	2	1	2	35	50	0	2	0	7	1	27	2	2	12	22
X41- Commerce, Transportation	536	105	431	0	7	25	68	87	2	2	2	20	1	6	12	0	22	4
X42- Service Industries	46	6	40	1	0	1	4	2	0	0	0	0	1	0	2	0	2	1
X43- Government or Other	480	242	238	6	4	20	56	105	8	2	2	2	6	12	63	12	15	72
X44- Liberal Professions	621	358	263	2	4	49	71	142	24	0	24	4	24	44	92	6	19	12
X45- Social Services	679	151	528	4	6	22	57	37	41	26	41	2	2	2	29	2	7	12
Position																		
X46- Public Employee	1095	365	730	11	2	99	92	158	30	12	30	15	15	41	111	25	21	80
X47- Employer or Own Account	708	402	306	5	3	21	111	151	24	4	24	26	20	20	97	5	27	9
X48- Private Employee	913	190	723	11	11	27	100	61	12	20	12	16	2	28	22	11	22	20
Migration																		
X49- No Migration	1200	277	918	13	12	20	118	155	42	12	42	21	21	42	104	12	26	29
X50- From Rural	118	29	77	2	1	4	14	17	4	1	4	2	1	4	12	2	2	2
X51- From Urban	1306	536	769	12	2	23	173	196	20	26	20	24	21	22	111	20	26	26
Environment																		
X52- Urban	2313	830	1422	25	19	142	256	345	124	44	124	56	20	106	218	22	46	96
X53- Suburban	168	52	116	1	2	20	12	13	5	2	5	7	2	2	2	1	2	7
X54- Rural	236	72	181	1	1	25	20	12	7	2	7	4	7	2	4	2	2	20

TABLE 77

SANTA CATARINA

REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	97							Intercept 2.41691					11,811
z_2 - 2 years	22							0.00610	-0.05692	-0.24219	0.15456	-1.56697	8,800
z_3 - 3 years	187							0.06865	0.09809	0.37671	0.05680	10.39187	19,958
z_4 - 4 years	308							0.11188	0.08327	0.47276	0.04498	10.52490	17,987
z_5 - 5 years	370							0.13618	0.50386	0.91109	0.04138	22.04778	27,883
z_6 - 6 years	136							0.06006	0.27781	1.27773	0.06419	19.90653	40,231
Age													
z_7 - 19 years midpoint	62	0.02289	-0.19183	-1.34339	0.06886	-13.57698	5,256						
z_8 - 22 " "	514	0.18918	-0.33481	-0.88034	0.04554	-19.33273	8,361						
z_9 - 27 " "	649	0.23867	-0.07949	-0.42471	0.04305	-9.86521	13,172						
z_{10} - 32 " "	804	0.18580	0.11596	-0.10658	0.04577	-2.32885	18,106						
z_{11} - 39 " "	586	Intercept 3.00281					20,142						
z_{12} - 49 " "	373	0.10048	0.18087	0.14013	0.05484	2.55498	23,171						
z_{13} - 59 " "	151	0.04821	0.06413	-0.07189	0.07189	-0.99998	18,745						
z_{14} - 68 " "	46	0.01767	0.08349	0.08184	0.11113	0.19656	20,587						
Course Completed													
z_{15} - Secondary	1,780												
z_{16} - Philosophy	88												
z_{17} - Medicine	136												
z_{18} - Pharmacy	97												
z_{19} - Dentistry	103												
z_{20} - Engineering	119												
z_{21} - Law	280												
z_{22} - Agronomy	41												
z_{23} - Econ./Pol. Science	78												
z_{24} - All other courses completed except Seminary	138												
Sex													
z_{25} - Female	688												
z_{26} - Male	2,094												

		Head of Family	
x_{27} - Not Head	945		
x_{28} - Head	1,776		
		Religion	
x_{29} - Protestant	388		
x_{30} - Jewish	7		
x_{31} - Other	180		
x_{32} - Roman Catholic	2,188		
		Race	
x_{33} - Black	16		
x_{34} - White	2,897		
x_{35} - Other	8		
		Children	
x_{36} - Has Children	1,847		
x_{37} - No Children	1,070		
		Class of Activity	
x_{38} - Agriculture	60		
x_{39} - Extractive	48		
x_{40} - Mfg. Industry	807		
x_{41} - Commerce and Transportation	838		
x_{42} - Service Industries	46		
x_{43} - Government or Other	488		
x_{44} - Liberal Professions	661		
x_{45} - Social Services	670		
		Position	
x_{46} - Public Employee	1,088		
x_{47} - Employer or Own Account . .	708		
x_{48} - Private Employee	913		
		Migration	
x_{49} - No Migration	1,888		
x_{50} - From Rural	116		
x_{51} - From Urban	1,806		
		Environment	
x_{52} - Urban	2,815		
x_{53} - Suburban	168		
x_{54} - Rural	886		
		Analysis of Variance	
"F" Value		100.36828	178.88871
R^2 ($\bar{R}^2$)		.80886 (.80421)	.84296 (.84183)
Std. Error of Estimate . . .		0.72761	0.72089

TABLE 77

REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
STATE OF SANTA CATARINA
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 3						Regression nº 4					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	97												
z_2 - 2 years	82												
z_3 - 3 years	187												
z_4 - 4 years	308												
z_5 - 5 years	270												
z_6 - 6 years	136												
Age													
z_7 - 19 years midpoint	62												
z_8 - 22 " "	514												
z_9 - 27 " "	648												
z_{10} - 32 " "	304												
z_{11} - 39 " "	226												
z_{12} - 49 " "	273												
z_{13} - 59 " "	131												
z_{14} - 68 " "	48												
Course Completed													
z_{15} - Secondary	1,780	Intercept 2.41736					11,817						
z_{16} - Philosophy	82	0.01914	-0.01880	0.18686	0.10086	1.84670	15,813						
z_{17} - Medicine	126	0.05006	0.27751	1.27725	0.06363	20.05258	40,231						
z_{18} - Pharmacy	67	0.03466	0.09638	0.42564	0.09922	4.76804	17,161						
z_{19} - Dentistry	108	0.05791	0.05896	0.51103	0.07267	7.03248	18,698						
z_{20} - Engineering	119	0.04360	0.17468	0.95855	0.07740	12.38727	29,013						
z_{21} - Law	280	0.08465	0.23876	0.91065	0.05086	18.11915	27,884						
z_{22} - Agronomy	41	0.01809	0.05894	0.67823	0.11284	5.98813	22,101						
z_{23} - Econ./Pol. Science	76	0.04747	0.06143	0.57534	0.06898	8.86093	19,940						
z_{24} - All other courses completed except Seminary	128	0.04896	0.12836	0.78740	0.06446	11.98454	23,818						
Sex													
z_{25} - Female	692							0.25680	-0.44092	-0.93866	0.03381	-27.73626	7,947
z_{26} - Male	2,094							Intercept 2.90726					18,806

Head of Family			
x_{27} - Not Head	943		
x_{28} - Head	1,774		
Religion			
x_{29} - Protestant	388		
x_{30} - Jewish	7		
x_{31} - Other	189		
x_{32} - Roman Catholic	2,188		
Race			
x_{33} - Black	14		
x_{34} - White	2,697		
x_{35} - Other	6		
Children			
x_{36} - Has Children	1,647		
x_{37} - No Children	1,070		
Class of Activity			
x_{38} - Agriculture	60		
x_{39} - Extractive	48		
x_{40} - Mfg. Industry	397		
x_{41} - Commerce and Transportation	596		
x_{42} - Service Industries	46		
x_{43} - Government or Other	480		
x_{44} - Liberal Professions	621		
x_{45} - Social Services	670		
Position			
x_{46} - Public Employee	1,098		
x_{47} - Employer or Own Account	708		
x_{48} - Private Employee	918		
Migration			
x_{49} - No Migration	1,989		
x_{50} - From Rural	116		
x_{51} - From Urban	1,306		
Environment			
x_{52} - Urban	2,213		
x_{53} - Suburban	188		
x_{54} - Rural	226		
Analysis of Variance			
"F" Value		100.61798	788.47161
R^2 (R^2)		.28067 (.24844)	.28068 (.22068)
Std. Error of Estimate		0.71681	0.78067

TABLE 77

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 5						Regression nº 6					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Inc.
Years of University Completed													
z_1 - 1 year	87												
z_2 - 2 years	28												
z_3 - 3 years	187												
z_4 - 4 years	308												
z_5 - 5 years	370												
z_6 - 6 years	136												
Age													
z_7 - 19 years midpoint	62												
z_8 - 22 " "	514												
z_9 - 27 " "	649												
z_{10} - 32 " "	504												
z_{11} - 39 " "	536												
z_{12} - 49 " "	273												
z_{13} - 59 " "	131												
z_{14} - 68 " "	48												
Course Completed													
z_{15} - Secondary	1,760												
z_{16} - Philosophy	82												
z_{17} - Medicine	136												
z_{18} - Pharmacy	67												
z_{19} - Dentistry	103												
z_{20} - Engineering	119												
z_{21} - Law	230												
z_{22} - Agronomy	41												
z_{23} - Econ./Pol. Science	78												
z_{24} - All other courses completed except Seminary	111												
Sex													
z_{25} - Female	622												
z_{26} - Male	2,084												

Head of Family			
x_{27} - Not Head	943	0.34707 -0.49012 -0.84768 0.05948 -89.14867 8,516	
x_{28} - Head	1,776	Intercept 2.98969 19,978	
Religion			
x_{29} - Protestant	368		0.13594 0.09164 0.07840 0.04673 1.84988 15,808
x_{30} - Jewish	7		0.00288 0.06441 0.01494 0.31178 2.93448 36,008
x_{31} - Other	160		0.05889 0.06780 0.25078 0.04748 3.71848 18,880
x_{32} - Roman Catholic	2,188		Intercept 2.66968 14,480
Race			
x_{33} - Black	16		
x_{34} - White	2,897		
x_{35} - Other	6		
Children			
x_{36} - Has Children	1,647		
x_{37} - No Children	1,070		
Class of Activity			
x_{38} - Agriculture	40		
x_{39} - Extractive	48		
x_{40} - Mfg. Industry	397		
x_{41} - Commerce and Transportation	326		
x_{42} - Service Industries	46		
x_{43} - Government or Other	489		
x_{44} - Liberal Professions	621		
x_{45} - Social Services	670		
Position			
x_{46} - Public Employee	1,096		
x_{47} - Employer or Own Account	708		
x_{48} - Private Employee	913		
Migration			
x_{49} - No Migration	1,989		
x_{50} - From Rural	116		
x_{51} - From Urban	1,308		
Environment			
x_{52} - Urban	2,313		
x_{53} - Suburban	168		
x_{54} - Rural	296		
Analysis of Variance			
"F" Value		849.63317	7.79686
R^2 ($\bar{R}^2$)		.79886 (.23835)	.00888 (.00820)
Std. Error of Estimate		0.72161	0.82361

TABLE 77

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 7						Regression nº 8					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	97												
z_2 - 2 years	22												
z_3 - 3 years	187												
z_4 - 4 years	308												
z_5 - 5 years	370												
z_6 - 6 years	136												
Age													
z_7 - 19 years midpoint	82												
z_8 - 22 " "	514												
z_9 - 27 " "	649												
z_{10} - 32 " "	804												
z_{11} - 39 " "	536												
z_{12} - 49 " "	373												
z_{13} - 59 " "	121												
z_{14} - 68 " "	48												
Course Completed													
z_{15} - Secondary	1,760												
z_{16} - Philosophy	82												
z_{17} - Medicine	156												
z_{18} - Pharmacy	67												
z_{19} - Dentistry	103												
z_{20} - Engineering	119												
z_{21} - Law	220												
z_{22} - Agronomy	41												
z_{23} - Econ./Pol. Science	76												
z_{24} - All other courses completed													
[illegible]	[illegible]												
Sex													
z_{25} - Female	695												
z_{26} - Male	2,004												

Head of Family			
x_{27} - Not Head	943		
x_{28} - Head	1,774		
Religion			
x_{29} - Protestant	368		
x_{30} - Jewish	7		
x_{31} - Other	163		
x_{32} - Roman Catholic	2,189		
Race			
x_{33} - Black	14	0.00615 -0.04496 -0.81193 0.29130 -2.81388 8,910	
x_{34} - White	9,697	Intercept 2.69909 14,866	
x_{35} - Other	6	0.00981 -0.09713 -0.48038 0.35754 -1.49802 9,196	
Children			
x_{36} - Has Children	1,647		0.60618 0.35726 0.60437 0.08038 19.98069 18,798
x_{37} - No Children	1,070		Intercept 2.39908 10,868
Class of Activity			
x_{38} - Agriculture	40		
x_{39} - Extractive	48		
x_{40} - Mfg. Industry	987		
x_{41} - Commerce and Transportation	536		
x_{42} - Service Industries	46		
x_{43} - Government or Other	480		
x_{44} - Liberal Professions	681		
x_{45} - Social Services	979		
Position			
x_{46} - Public Employee	1,096		
x_{47} - Employer or Own Account . .	708		
x_{48} - Private Employee	913		
Migration			
x_{49} - No Migration	1,889		
x_{50} - From Rural	116		
x_{51} - From Urban	1,808		
Environment			
x_{52} - Urban	9,813		
x_{53} - Suburban	186		
x_{54} - Rural	286		
Analysis of Variance			
"F" Value		3.67703	367.23880
R^2 $(\bar{R}^2)$		.00370 (.00235)	.19763 (.12764)
Std. Error of Estimate . . .		0.92589	0.77288

TABLE 77

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 9						Regression nº 10					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Inc.
Years of University Completed													
x_1 - 1 year	87												
x_2 - 2 years	82												
x_3 - 3 years	187												
x_4 - 4 years	308												
x_5 - 5 years	270												
x_6 - 6 years	136												
Age													
x_7 - 19 years midpoint	88												
x_8 - 22 " "	814												
x_9 - 27 " "	649												
x_{10} - 32 " "	304												
x_{11} - 39 " "	236												
x_{12} - 49 " "	173												
x_{13} - 59 " "	121												
x_{14} - 68 " "	48												
Course Completed													
x_{15} - Secondary	1,760												
x_{16} - Philosophy	82												
x_{17} - Medicine	136												
x_{18} - Pharmacy	67												
x_{19} - Dentistry	103												
x_{20} - Engineering	119												
x_{21} - Law	230												
x_{22} - Agronomy	41												
x_{23} - Econ./Pol. Science	76												
x_{24} - All other courses completed except Seminary	128												
Sex													
x_{25} - Female	698												
x_{26} - Male	2,004												

Head of Family									
x_{27} - Not Head	943								
x_{28} - Head	1,776								
Religion									
x_{29} - Protestant	368								
x_{30} - Jewish	7								
x_{31} - Other	160								
x_{32} - Roman Catholic	2,188								
Race									
x_{33} - Black	14								
x_{34} - White	2,897								
x_{35} - Other	6								
Children									
x_{36} - Has Children	1,647								
x_{37} - No Children	1,070								
Class of Activity									
x_{38} - Agriculture	40	0.01472	-0.03794	-0.50750	0.12658	-4.00926	11,460		
x_{39} - Extractive	48	0.01787	0.08719	0.96866	0.11644	9.19662	24,861		
x_{40} - Mfg. Industry	967	0.09827	0.08346	-0.04198	0.06872	-0.71486	18,955		
x_{41} - Commerce and Transportation	536	0.19798	0.00816	-0.23733	0.04834	-4.91010	15,014		
x_{42} - Service Industries	46	0.01693	-0.04491	-0.52937	0.11672	-4.45907	11,919		
x_{43} - Government or Other	480	Intercept		2.94633			19,038		
x_{44} - Liberal Professions	691	0.22856	0.15309	-0.01858	0.04675	-0.39742	18,686		
x_{45} - Social Services	679	0.24991	-0.23844	-0.73558	0.04587	-16.03688	9,195		
Position									
x_{46} - Public Employee	1,098	Intercept		2.56019					18,938
x_{47} - Employer or Own Account	708	0.26058	0.26384	0.50986	0.03846	13.06855			91,388
x_{48} - Private Employee	913	0.33603	-0.10550	0.01963	0.03574	0.36337			18,108
Migration									
x_{49} - No Migration	1,988								
x_{50} - From Rural	118								
x_{51} - From Urban	1,308								
Environment									
x_{52} - Urban	2,513								
x_{53} - Suburban	168								
x_{54} - Rural	236								
Analysis of Variance									
"F" Value		61.71411					101.60098		
R^2 ($\bar{R}^2$)		.13687 (.13467)					.08968 (.06933)		
Std. Error of Estimate		0.76917					0.79768		

TABLE 77

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 11						Regression nº 12					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	27												
z_2 - 2 years	22												
z_3 - 3 years	187												
z_4 - 4 years	303												
z_5 - 5 years	370												
z_6 - 6 years	136												
Age													
z_7 - 19 years midpoint	62												
z_8 - 22 " "	814												
z_9 - 27 " "	649												
z_{10} - 32 " "	504												
z_{11} - 39 " "	536												
z_{12} - 49 " "	273												
z_{13} - 59 " "	131												
z_{14} - 68 " "	48												
Course Completed													
z_{15} - Secondary	1,760												
z_{16} - Philosophy	89												
z_{17} - Medicine	136												
z_{18} - Pharmacy	97												
z_{19} - Dentistry	103												
z_{20} - Engineering	119												
z_{21} - Law	280												
z_{22} - Agronomy	41												
z_{23} - Econ./Pol. Science	78												
z_{24} - All other courses completed except Seminary	133												
Sex													
z_{25} - Female	695												
z_{26} - Male	9,084												

x_{27} - Not Head	943			
x_{28} - Head	1,774			
Religion				
x_{29} - Protestant	368			
x_{30} - Jewish	7			
x_{31} - Other	180			
x_{32} - Roman Catholic	2,188			
Race				
x_{33} - Black	14			
x_{34} - White	2,697			
x_{35} - Other	8			
Children				
x_{36} - Has Children	1,647			
x_{37} - No Children	1,070			
Class of Activity				
x_{38} - Agriculture	40			
x_{39} - Extractive	48			
x_{40} - Mfg. Industry	257			
x_{41} - Commerce and Transportation	526			
x_{42} - Service Industries	46			
x_{43} - Government or Other	480			
x_{44} - Liberal Professions	661			
x_{45} - Social Services	679			
Position				
x_{46} - Public Employee	1,096			
x_{47} - Employer or Own Account	708			
x_{48} - Private Employee	913			
Migration				
x_{49} - No Migration	1,789	0.47449 -0.11467 -0.91640 0.03219 -6.73704	13,408	
x_{50} - From Rural	116	0.04289 -0.08288 -0.32317 0.07934 -4.07349	19,048	
x_{51} - From Urban	1,308	Intercept 2.81188	18,641	
Environment				
x_{52} - Urban	2,313			0.85131 0.12670 0.36944 0.05601 6.89606 18,474
x_{53} - Suburban	168			0.06183 -0.04507 0.18067 0.08274 2.18243 18,811
x_{54} - Rural	286			Intercept 2.36772 10,884
Analysis of Variance				
"F" Value		98.55390		84.86026
R^2 ($\bar{R}^2$)		.01919 (.01884)		.01333 (.01298)
Std. Error of Estimate		0.81908		0.81969

TABLE 77

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 13 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.	Regression nº 14 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	27	Intercept 2.72152					15,203						
x_2 - 2 years	22	0.00810	-0.08699	-0.15634	0.14497	-1.07846	13,003						
x_3 - 3 years	187	0.06883	0.09809	0.46727	0.05236	8.92392	24,259						
x_4 - 4 years	303	0.11152	0.08397	0.27220	0.04340	6.27256	19,960						
x_5 - 5 years	370	0.13418	0.30368	0.70093	0.04032	17.38286	30,644						
x_6 - 6 years	136	0.05406	0.27751	1.03929	0.06149	16.90304	42,963						
Age													
x_7 - 19 years midpoint	69	0.02282	-0.19155	-1.06210	0.09154	-11.60223	5,856	0.02282	-0.19153	-1.06914	0.09106	-11.63180	5,908
x_8 - 22 " "	514	0.18918	-0.33481	-0.64393	0.04324	-14.89184	7,986	0.18918	-0.33481	-0.62541	0.04308	-14.51980	8,036
x_9 - 27 " "	649	0.23697	-0.07949	-0.30431	0.03987	-7.63217	11,918	0.23697	-0.07949	-0.28572	0.03969	-7.19896	11,287
x_{10} - 32 " "	504	0.18550	0.11896	-0.10233	0.04189	-2.44271	13,726	0.18550	0.11896	-0.09705	0.04170	-2.32716	13,630
x_{11} - 39 " "	336	Intercept 2.72152					15,203	Intercept 2.70934					15,019
x_{12} - 45 " "	273	0.10048	0.18097	0.08188	0.08028	1.69582	16,497	0.10048	0.18097	0.10525	0.08034	2.09484	16,686
x_{13} - 59 " "	131	0.04821	0.06413	-0.06864	0.06577	-1.04383	14,196	0.04821	0.06413	-0.05258	0.06561	-0.79886	14,250
x_{14} - 68 " "	46	0.01767	0.05342	-0.11472	0.10181	-1.12678	13,556	0.01767	0.05342	-0.09594	0.10146	-0.94008	13,645
Course Completed													
x_{15} - Secondary	1,760							Intercept 2.70934					15,019
x_{16} - Philosophy	82							0.01914	-0.01550	-0.03309	0.09557	-0.34639	14,531
x_{17} - Medicine	136							0.05906	0.27751	1.04106	0.06116	17.02697	49,550
x_{18} - Pharmacy	67							0.02466	0.02839	0.24469	0.08445	2.89758	19,183
x_{19} - Dentistry	103							0.03791	0.06896	0.33829	0.06977	4.91933	21,065
x_{20} - Engineering	119							0.04380	0.17409	0.73433	0.06513	11.27609	31,301
x_{21} - Law	980							0.06466	0.23278	0.70411	0.04840	14.54778	30,370
x_{22} - Agronomy	41							0.01809	0.06994	0.46368	0.10686	4.33893	24,361
x_{23} - Econ./Pol. Science	76							0.02797	0.08108	0.30817	0.07344	4.97456	22,298
x_{24} - All other courses completed except Seminary	138							0.04880	0.12338	0.87158	0.06090	9.37579	96,607
Sex													
x_{25} - Female	648												
x_{26} - Male	2,094												

x_{27} - Not Head	965		
x_{28} - Head	2,774		
Religion			
x_{29} - Protestant	369		
x_{30} - Jewish	7		
x_{31} - Other	160		
x_{32} - Roman Catholic	2,188		
Race			
x_{33} - Black	16		
x_{34} - White	2,697		
x_{35} - Other	6		
Children			
x_{36} - Has Children	1,647		
x_{37} - No Children	1,070		
Class of Activity			
x_{38} - Agriculture	40		
x_{39} - Extractive	48		
x_{40} - Mfg. Industry	307		
x_{41} - Commerce and Transportation	326		
x_{42} - Service Industries	46		
x_{43} - Government or Other	489		
x_{44} - Liberal Professions	661		
x_{45} - Social Services	679		
Position			
x_{46} - Public Employee	1,096		
x_{47} - Employer or Own Account	708		
x_{48} - Private Employee	913		
Migration			
x_{49} - No Migration	1,909		
x_{50} - From Rural	116		
x_{51} - From Urban	1,806		
Environment			
x_{52} - Urban	2,813		
x_{53} - Suburban	168		
x_{54} - Rural	966		
Analysis of Variance			
"F" Value		114.08762	88.43459
R^2 ($\bar{R}^2$)		.39718 (.33449)	.34388 (.34021)
Std. Error of Estimate		0.67484	0.67163

TABLE 77

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM TOTAL SAMPLE
(CONTINUED)

Variable Number and Description	Sample Size	Regression nº 15						Regression nº 16					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	97							Intercept	3.01047				20,297
z_2 - 2 years	22							0.00810	-0.00697	-0.00648	0.13075	-1.60069	16,478
z_3 - 3 years	167							0.00683	0.00839	0.12278	0.09142	1.34299	22,948
z_4 - 4 years	303							0.11158	0.08327	-0.05427	0.09808	-0.55336	19,725
z_5 - 5 years	370							0.13618	0.30388	0.07743	0.15252	0.50769	21,931
z_6 - 6 years	136							Intercept	3.01047				20,297
Age													
z_7 - 19 years midpoint	62	0.02297	-0.19153	-1.71094	0.09319	-18.99400	7,303	0.02282	-0.19153	-0.61870	0.08689	-7.10196	10,966
z_8 - 22 " "	514	0.18918	-0.33481	-0.80896	0.04306	-18.64828	10,983	0.18918	-0.33481	-0.32268	0.04527	-7.12783	14,699
z_9 - 27 " "	649	0.23887	-0.07949	-0.39914	0.04052	-9.85063	16,447	0.23887	-0.07949	-0.15557	0.03753	-4.14486	17,373
z_{10} - 32 " "	504	0.18680	0.11896	-0.08349	0.04299	-2.17493	22,327	0.18680	0.11896	-0.05491	0.03765	-1.45846	19,212
z_{11} - 39 " "	536	Intercept	3.19988				24,515	Intercept	3.01047				20,297
z_{12} - 49 " "	273	0.10048	0.18097	0.11899	0.06150	2.29701	27,393	0.10048	0.18097	0.05809	0.04542	1.27906	21,511
z_{13} - 59 " "	131	0.04821	0.06413	-0.06806	0.06752	-0.85975	23,138	0.04821	0.06413	-0.11254	0.05968	-1.88629	18,136
z_{14} - 68 " "	48	0.01767	0.05342	-0.00779	0.10483	-0.07432	24,328	0.01767	0.05342	-0.12264	0.09249	-1.32598	17,954
Course Completed													
z_{15} - Secondary	1,760							Intercept	3.01047				20,297
z_{16} - Philosophy	88							0.01914	-0.01880	0.14759	0.12873	1.14652	23,725
z_{17} - Medicine	136							0.00406	0.27751	0.91771	0.08927	10.48477	30,815
z_{18} - Pharmacy	67							0.00466	0.08832	0.01136	0.11815	0.09774	20,529
z_{19} - Dentistry	103							0.02791	0.06896	0.17418	0.10854	1.60448	24,158
z_{20} - Engineering	119							0.04380	0.17408	0.48048	0.16719	2.77718	31,845
z_{21} - Law	220							0.08466	0.23276	0.48736	0.15819	2.89244	28,087
z_{22} - Agronomy	41							0.01809	0.08894	0.41966	0.13868	3.07186	30,887
z_{23} - Econ./Pol. Science	76							0.02797	0.06103	0.21362	0.11970	1.78378	26,196
z_{24} - All other courses completed except Seminary	188							0.04886	0.12328	0.36284	0.09848	3.68640	29,807
Sex													
z_{25} - Female	982							0.22930	-0.46998	-0.51438	0.04896	-7.51716	14,822
z_{26} - Male	2,094							Intercept	3.01047				20,297

x_{27} - Not Read	948							0.34707	-0.48881	-0.22514	0.03694	-6.21878	16,908
x_{28} - Read	1,774							Intercept	3.01047				20,297
Religion													
x_{29} - Protestant	388							0.13364	0.02164	-0.00988	0.03677	-0.27848	20,068
x_{30} - Jewish	7							0.00288	0.03481	0.00765	0.92041	2.89768	20,078
x_{31} - Other	169							0.05889	0.00780	0.00880	0.00015	1.08875	21,897
x_{32} - Roman Catholic	2,188							Intercept	3.01047				20,297
Race													
x_{33} - Black	14							0.00818	-0.04498	0.01718	0.16517	0.07444	20,848
x_{34} - White	2,097							Intercept	3.01047				20,297
x_{35} - Other	8							0.00221	-0.01713	-0.15868	0.94808	-0.63878	17,819
Children													
x_{36} - Has Children	1,647							Intercept	3.01047				20,297
x_{37} - No Children	1,070							0.36388	-0.36726	-0.11511	0.03068	-3.68861	18,188
Class of Activity													
x_{38} - Agriculture	40	0.01472	-0.03794	-0.57422	0.11309	-5.03739	13,808	0.01472	-0.03794	-0.36716	0.10988	-3.27886	14,801
x_{39} - Extractive	48	0.01767	0.08718	0.80746	0.10489	1.97792	20,167	0.01767	0.08718	0.37897	0.09942	3.78184	20,841
x_{40} - Mfg. Industry	267	0.09827	0.08346	-0.08766	0.08290	-1.09374	23,137	0.09827	0.08346	0.08689	0.08098	1.11913	21,679
x_{41} - Commerce and Transportation	536	0.19726	0.00916	-0.17893	0.04363	-4.01617	20,574	0.19726	0.00816	0.00689	0.08131	0.13900	20,496
x_{42} - Service Industries	46	0.01693	-0.04421	-0.59990	0.10690	-4.95097	14,441	0.01693	-0.04421	-0.33643	0.10188	-3.30060	14,818
x_{43} - Government or Other	480	Intercept	3.19998				24,518	Intercept	3.01047				20,297
x_{44} - Liberal Professions	621	0.22856	0.18302	-0.04134	0.04219	-0.97998	23,822	0.22856	0.18302	-0.13779	0.05498	-2.50721	17,688
x_{45} - Social Services	679	0.24991	-0.55844	-0.69888	0.04151	-15.15152	13,071	0.24991	-0.33844	-0.22030	0.04253	-5.22436	18,188
Position													
x_{46} - Public Employee	1,096							Intercept	3.01047				20,297
x_{47} - Employer or Own Account	708							0.26068	0.26304	0.04679	0.04868	0.96713	21,269
x_{48} - Private Employee	913							0.33606	-0.10660	-0.11809	0.04206	-2.80755	18,088
Migration													
x_{49} - No Migration	1,988							0.47442	-0.11487	0.01194	0.02478	0.48189	20,886
x_{50} - From Rural	116							0.04269	-0.09262	-0.09289	0.08946	-1.84836	18,486
x_{51} - From Urban	1,808							Intercept	3.01047				20,297
Environment													
x_{52} - Urban	2,313							Intercept	3.01047				20,297
x_{53} - Suburban	168							0.06183	-0.04807	-0.10212	0.04679	-2.09778	18,367
x_{54} - Rural	236							0.08686	-0.12182	-0.25186	0.04321	-5.82938	18,778
Analysis of Variance													
"F" Value			83.78487						89.20942				
R^2 ($\bar{R}^2$)			.30771 (.30147)						.47876 (.46793)				
Std. Error of Estimate			0.69911						0.61514				

TABLE 78

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	161							Intercept	3.07880				21,738
z_4 - 4 years	289							0.30198	-0.27291	-0.18620	0.06868	-2.69859	18,058
z_5 - 5 years	365							0.38140	0.12964	0.08246	0.06601	3.82467	27,974
z_6 - 6 years	126							0.14211	0.46321	0.61585	0.08161	7.54619	40,231
Age													
z_7 - 19 years midpoint	1	Intercept	3.31746				27,560						
z_8 - 22 " "	38	0.04078	-0.44068	-0.47913	0.15792	-3.76545	17,087						
z_9 - 27 " "	122	0.19018	-0.13644	-0.38594	0.07844	-4.46201	19,970						
z_{10} - 32 " "	238	0.24869	0.03647	-0.05902	0.06734	-0.87649	26,009						
z_{11} - 39 " "	248	Intercept	3.31746				27,560						
z_{12} - 49 " "	156	0.16301	0.07572	0.01869	0.07586	0.24637	28,111						
z_{13} - 59 " "	61	0.06374	-0.04106	-0.22953	0.10612	-2.16286	21,932						
z_{14} - 68 " "	32	0.03344	0.00139	-0.10549	0.13980	-0.75874	24,330						
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	88												
z_{17} - Medicine	126												
z_{18} - Pharmacy	67												
z_{19} - Dentistry	103												
z_{20} - Engineering	119												
z_{21} - Law	280												
z_{22} - Agronomy	41												
z_{23} - Econ./Pol. Science	76												
z_{24} - All other courses completed except Seminary	135												
Sex													
z_{25} - Female	40												
z_{26} - Male	908												

x_{27} - Not Head	121		
x_{28} - Head	885		
Religion			
x_{29} - Protestant	121		
x_{30} - Jewish	8		
x_{31} - Other	70		
x_{32} - Roman Catholic	744		
Race			
x_{33} - Black	1		
x_{34} - White	988		
x_{35} - Other	1		
Children			
x_{36} - Has Children	703		
x_{37} - No Children	354		
Class of Activity			
x_{38} - Agriculture	19		
x_{39} - Extractive	14		
x_{40} - Mfg. Industry	91		
x_{41} - Commerce and Transportation	108		
x_{42} - Service Industries	8		
x_{43} - Government or Other	948		
x_{44} - Liberal Professions	338		
x_{45} - Social Services	181		
Position			
x_{46} - Public Employee	368		
x_{47} - Employer or Own Account	408		
x_{48} - Private Employee	190		
Migration			
x_{49} - No Migration	377		
x_{50} - From Rural	89		
x_{51} - From Urban	536		
Environment			
x_{52} - Urban	830		
x_{53} - Suburban	82		
x_{54} - Rural	78		
Analysis of Variance			
"F" Value		6.96812	46.14198
R^2 ($\bar{R}^2$)		.05798 (.03290)	.19868 (.12501)
Std. Error of Estimate		0.74988	0.70837

TABLE 78

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 3						Regression nº 4					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	161												
x_4 - 4 years	290												
x_5 - 5 years	365												
x_6 - 6 years	136												
Age													
x_7 - 19 years midpoint	1												
x_8 - 22 " "	39												
x_9 - 27 " "	188												
x_{10} - 32 " "	226												
x_{11} - 39 " "	248												
x_{12} - 49 " "	156												
x_{13} - 59 " "	61												
x_{14} - 68 " "	32												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	82	Intercept		2.60368			13,813						
x_{17} - Medicine	126	0.14211	0.26321	1.09099	0.11489	9.54820	40,231						
x_{18} - Pharmacy	67	0.07001	-0.13827	0.93899	0.12954	1.84486	17,161						
x_{19} - Dentistry	103	0.10763	-0.19806	0.32478	0.11924	2.72371	18,698						
x_{20} - Engineering	119	0.19438	0.08044	0.78410	0.11682	6.58785	89,013						
x_{21} - Law	220	0.26033	0.09047	0.79440	0.10763	6.73087	97,984						
x_{22} - Agronomy	41	0.04984	-0.03118	0.49198	0.14640	3.36061	22,101						
x_{23} - Econ./Pol. Science	76	0.07841	-0.08377	0.39910	0.13615	3.06443	19,910						
x_{24} - All other courses completed except Seminary	133	0.13898	-0.03894	0.54113	0.11464	4.79089	23,215						
Sex													
x_{25} - Female	48							0.05190	-0.98018	-0.88909	0.10634	-0.01874	9,941
x_{26} - Male	908							Intercept		3.88978			23,940

x_{27} - Not Head	121		
x_{28} - Head	886		
Religion			
x_{29} - Protestant	151		
x_{30} - Jewish	5		
x_{31} - Other	79		
x_{32} - Roman Catholic	744		
Race			
x_{33} - Black	1		
x_{34} - White	985		
x_{35} - Other	1		
Children			
x_{36} - Has Children	703		
x_{37} - No Children	284		
Class of Activity			
x_{38} - Agriculture	10		
x_{39} - Extractive	14		
x_{40} - Mfg. Industry	91		
x_{41} - Commerce and Transportation	105		
x_{42} - Service Industries	6		
x_{43} - Government or Other	248		
x_{44} - Liberal Professions	338		
x_{45} - Social Services	181		
Position			
x_{46} - Public Employee	368		
x_{47} - Employer or Own Account	402		
x_{48} - Private Employee	190		
Migration			
x_{49} - No Migration	377		
x_{50} - From Rural	89		
x_{51} - From Urban	536		
Environment			
x_{52} - Urban	880		
x_{53} - Suburban	82		
x_{54} - Rural	78		
Analysis of Variance			
"F" Value		90.19800	81.39780
R^2 $(\bar{R}^2)$		.14519 (.13890)	.07848 (.07848)
Std. Error of Estimate		0.70094	0.72519

TABLE 78

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 8						Regression nº 9					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	161												
x_4 - 4 years	280												
x_5 - 5 years	365												
x_6 - 6 years	136												
Age													
x_7 - 19 years midpoint	1												
x_8 - 22 " "	30												
x_9 - 27 " "	182												
x_{10} - 32 " "	238												
x_{11} - 39 " "	248												
x_{12} - 49 " "	136												
x_{13} - 59 " "	61												
x_{14} - 68 " "	28												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	28												
x_{17} - Medicine	136												
x_{18} - Pharmacy	97												
x_{19} - Dentistry	103												
x_{20} - Engineering	119												
x_{21} - Law	280												
x_{22} - Agronomy	41												
x_{23} - Econ./Pol. Science	76												
x_{24} - All other courses completed except Seminary	133												
Sex													
x_{25} - Female	60												
x_{26} - Male	906												

X_{27} - Not Fixed	121	0.13689 -0.72716 -0.48771 0.06998 -7.04186 16,218	
X_{28} - Fixed	879	Intercept 8.97844 96,408	
Religion			
X_{29} - Protestant	131		0.13689 -0.07016 -0.18497 0.07141 -2.18040 91,619
- Jewish	3		0.00313 0.04136 0.53649 0.43600 1.99608 43,068
X_{31} - Other	79		0.08755 0.00014 -0.09061 0.08918 -0.23897 24,708
X_{32} - Roman Catholic	744		Intercept 8.97788 98,288
Race			
X_{33} - Black	1		
X_{34} - White	988		
X_{35} - Other	1		
Children			
X_{36} - Has Children	703		
X_{37} - No Children	354		
Class of Activity			
X_{38} - Agriculture	10		
X_{39} - Extractive	14		
X_{40} - Mfg. Industry	91		
X_{41} - Commerce and Transportation	108		
X_{42} - Service Industries	6		
X_{43} - Government or Other	248		
X_{44} - Liberal Professions	338		
X_{45} - Social Services	181		
Position			
X_{46} - Public Employee	368		
X_{47} - Employer or Own Account . .	408		
X_{48} - Private Employee	190		
Migration			
X_{49} - No Migration	377		
X_{50} - From Rural	89		
X_{51} - From Urban	536		
Environment			
X_{52} - Urban	830		
X_{53} - Suburban	88		
X_{54} - Rural	78		
Analysis of Variance			
"F" Value		49.58350	8.10310
R^2 ($\bar{R}^2$)		.04936 (.04936)	.00668 (.00451)
Std. Error of Estimate . . .		0.73647	0.78368

TABLE 78

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 7						Regression nº 8					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	161												
x_4 - 4 years	289												
x_5 - 5 years	365												
x_6 - 6 years	126												
Age													
x_7 - 19 years midpoint	1												
x_8 - 22 " "	39												
x_9 - 27 " "	188												
x_{10} - 32 " "	238												
x_{11} - 39 " "	248												
x_{12} - 49 " "	136												
x_{13} - 59 " "	61												
x_{14} - 68 " "	22												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	52												
x_{17} - Medicine	136												
x_{18} - Pharmacy	67												
x_{19} - Dentistry	103												
x_{20} - Engineering	119												
x_{21} - Law	230												
x_{22} - Agronomy	41												
x_{23} - Econ./Pol. Science	76												
x_{24} - All other courses completed except Seminary	133												
Sex													
x_{25} - Female	40												
x_{26} - Male	908												

x_{27} - Not Head	121		
x_{28} - Head	886		
Religion			
x_{29} - Protestant	121		
x_{30} - Jewish	8		
x_{31} - Other	78		
x_{32} - Roman Catholic	744		
Race			
x_{33} - Black	1	0.00104 -0.02157 -0.49968 0.75880 -0.66113	18,000
x_{34} - White	985	Intercept 5.80772	94,788
x_{35} - Other	1	0.00104 -0.02137 -0.49968 0.75880 -0.66113	18,000
Children			
x_{36} - Has Children	708		0.73489 0.17336 0.79823 0.08446 5.43837 98,717
x_{37} - No Children	464		Intercept 2.98807 19,887
Class of Activity			
x_{38} - Agriculture	10		
x_{39} - Extractive	14		
x_{40} - Mfg. Industry	91		
x_{41} - Commerce and Transportation	108		
x_{42} - Service Industries	6		
x_{43} - Government or Other	248		
x_{44} - Liberal Professions	338		
x_{45} - Social Services	181		
Position			
x_{46} - Public Employee	365		
x_{47} - Employer or Own Account . .	408		
x_{48} - Private Employee	190		
Migration			
x_{49} - No Migration	377		
x_{50} - From Rural	30		
x_{51} - From Urban	536		
Environment			
x_{52} - Urban	880		
x_{53} - Suburban	88		
x_{54} - Rural	78		
Analysis of Variance			
"F" Value		0.43664	29.88670
R^2 ($\bar{R}^2$)		.00091 (.00013)	.03008 (.03045)
Std. Error of Estimate . . .		0.75849	0.74388

TABLE 78

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 9						Regression nº 10					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	161												
x_4 - 4 years	289												
x_5 - 5 years	365												
x_6 - 6 years	136												
Age													
x_7 - 19 years midpoint	1												
x_8 - 22 " "	30												
x_9 - 27 " "	188												
x_{10} - 32 " "	238												
x_{11} - 39 " "	248												
x_{12} - 49 " "	126												
x_{13} - 59 " "	61												
x_{14} - 68 " "	28												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	88												
x_{17} - Medicine	136												
x_{18} - Pharmacy	67												
x_{19} - Dentistry	103												
x_{20} - Engineering	119												
x_{21} - Law	230												
x_{22} - Agronomy	41												
x_{23} - Econ./Pol. Science	76												
x_{24} - All other courses completed except Seminary	138												
Sex													
x_{25} - Female	49												
x_{26} - Male	908												

x_{27} - Not Head	121							
x_{28} - Head	888							
Religion								
x_{29} - Protestant	121							
x_{30} - Jewish	3							
x_{31} - Other	79							
x_{32} - Roman Catholic	744							
Race								
x_{33} - Black	1							
x_{34} - White	988							
x_{35} - Other	1							
Children								
x_{36} - Has Childr n	708							
x_{37} - No Children	284							
Class of Activity								
x_{38} - Agriculture	10	0.01045	-0.03031	-0.36059	0.23884	-1.50915	19,700	
x_{39} - Extractive	14	0.01463	0.08753	0.40402	0.10384	1.98499	48,466	
x_{40} - Mfg. Industry	91	0.09509	-0.01583	-0.17418	0.08108	-1.81294	23,880	
x_{41} - Commerce and Transportation	106	0.10972	-0.07956	-0.30901	0.08853	-3.87198	20,615	
x_{42} - Service Industries	6	0.00627	-0.09071	-0.99969	0.30801	-3.26684	10,433	
x_{43} - Government or Other	242	Intercept	3.24469				28,388	
x_{44} - Liberal Professions	338	0.35319	0.05583	-0.08101	0.06226	-1.77919	26,146	
x_{45} - Social Services	151	0.15778	-0.19011	-0.34741	0.07679	-4.59493	20,081	
Position								
x_{46} - Public Employee	365					Intercept	8.97735	26,808
x_{47} - Employer or Own Account . .	408					0.42006	0.05252	-0.02400	0.05398	-0.44465	28,874
x_{48} - Private Employee	190					0.19864	-0.15441	-0.30467	0.06479	-4.86181	19,848
Migration								
x_{49} - No Migration	377							
x_{50} - From Rural	39							
x_{51} - From Urban	586							
Environment								
x_{52} - Urban	820							
x_{53} - Suburban	88							
x_{54} - Rural	78							
Analysis of Variance								
"F" Value				6.40608			11.78207	
R^2 ($\bar{R}^2$)				.04511 (.03909)			.0840 (.02299)	
Std. Error of Estimate . . .				0.76045			0.74661	

TABLE 78

STATE OF SANTA CATARINA
REGRESSIONS OF LO [illegible] FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 11						Regression nº 12					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	161												
x_4 - 4 years	269												
x_5 - 5 years	346												
x_6 - 6 years	134												
Age													
x_7 - 19 years midpoint	1												
x_8 - 22 " "	39												
x_9 - 27 " "	182												
x_{10} - 32 " "	236												
x_{11} - 39 " "	248												
x_{12} - 49 " "	134												
x_{13} - 59 " "	61												
x_{14} - 68 " "	32												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	82												
x_{17} - Medicine	136												
x_{18} - Pharmacy	97												
x_{19} - Dentistry	103												
x_{20} - Engineering	119												
x_{21} - Law	220												
x_{22} - Agronomy	41												
x_{23} - Econ./Pol. Science	76												
x_{24} - All other courses completed except Seminary	135												
Sex													
x_{25} - Female	46												
x_{26} - Male	908												

x_{27} - Not Head	181		
x_{28} - Head	866		
Religion			
x_{29} - Protestant	121		
x_{30} - Jewish	8		
x_{31} - Other	79		
x_{32} - Roman Catholic	744		
Race			
x_{33} - Black	1		
x_{34} - White	986		
x_{35} - Other	1		
Children			
x_{36} - Has Children	703		
x_{37} - No Children	284		
Class of Activity			
x_{38} - Agriculture	10		
x_{39} - Extractive	14		
x_{40} - Mfg. Industry	91		
x_{41} - Commerce and Transportation	108		
x_{42} - Service Industries	6		
x_{43} - Government or Other	242		
x_{44} - Liberal Professions	338		
x_{45} - Social Services	181		
Position			
x_{46} - Public Employee	365		
x_{47} - Employer or Own Account	402		
x_{48} - Private Employee	190		
Migration			
x_{49} - No Migration	377	0.39394 -0.02012 -0.04527 0.05062 -0.89446 24,236	
x_{50} - From Rural	30	0.04075 -0.05080 -0.21131 0.12508 -1.66925 20,829	
x_{51} - From Urban	536	Intercept 3.23319	25,380
Environment			
x_{52} - Urban	830		Intercept 3.23897 25,808
x_{53} - Suburban	92		0.05434 -0.00568 -0.05018 0.10706 -0.46868 24,980
x_{54} - Rural	78		0.07857 -0.13333 -0.37731 0.09030 -4.17648 17,491
Analysis of Variance			
"F" Value		1.69048	8.74541
R^2 ($\bar{R}^2$)		.00889 (.00227)	.01800 (.01698)
Std. Error of Estimate		0.78447	0.74691

TABLE 78

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 13						Regression nº 14					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	161							Intercept	3.80989				24,776
x_4 - 4 years	980							0.80199	-0.27891	-0.22778	0.06865	-3.31776	19,729
x_5 - 5 years	346							0.28140	0.12964	0.10166	0.06618	3.04793	30,312
x_6 - 6 years	126							0.14211	0.26321	0.55183	0.08201	6.72685	43,022
Age													
x_7 - 19 years midpoint	1												
x_8 - 22 " "	20	0.04078	-0.10062	-0.34552	0.19079	-2.86050	10,158	0.04078	-0.10062	-0.37835	0.12164	-3.11050	16,972
x_9 - 27 " "	182	0.19018	-0.13644	-0.93853	0.06818	-3.49869	11,308	0.19018	-0.13644	-0.27869	0.06872	-4.07936	18,784
x_{10} - 32 " "	226	0.24869	0.03947	-0.07560	0.06189	-0.40706	13,988	0.24869	0.03947	-0.03109	0.06332	-0.49097	24,018
x_{11} - 37 " "	948	Intercept	2.86362				14,361	Intercept	3.80989				24,776
x_{12} - 42 " "	156	0.16301	0.07572	0.07674	0.07158	1.07258	15,496	0.16301	0.07572	0.09451	0.07131	0.34368	25,391
x_{13} - 59 " "	61	0.06374	-0.04106	-0.18856	0.10018	-1.88308	11,998	0.06374	-0.04106	-0.90501	0.09973	-9.05369	20,184
x_{14} - 63 " "	28	0.03344	0.00139	-0.09298	0.13150	-0.70710	13,077	0.03344	0.00139	-0.14602	0.13106	-1.11413	21,410
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	92	Intercept	2.86362				14,361						
x_{17} - Medicine	126	0.14211	0.26321	1.07778	0.11347	9.49670	42,168						
x_{18} - Pharmacy	67	0.07011	-0.13297	0.26236	0.12660	2.04175	18,660						
x_{19} - Dentistry	106	0.10763	-0.12606	0.36464	0.11632	3.01419	20,801						
x_{20} - Engineering	119	0.12436	0.08044	0.76672	0.11353	6.75648	30,893						
x_{21} - Law	220	0.24033	0.09047	0.72126	0.10736	6.71910	29,574						
x_{22} - Agronomy	61	0.04894	-0.08118	0.51294	0.14567	3.52125	23,969						
x_{23} - Econ./Pol. Science	76	0.07941	-0.06347	0.40408	0.12804	3.20695	21,497						
x_{24} - Any other courses completed except Seminary	126	0.12698	-0.03894	0.56844	0.11363	4.96302	26,261						
Sex													
x_{25} - Female	46												
x_{26} - Male	908												

X_{27} = Not Reli...	181		
X_{28} = Total	888		
Religion			
X_{29} = ...	181		
X_{30} = C...	8		
X_{31} = Other	79		
X_{32} = ... atholic	744		
Race			
X_{33} = Black	1		
X_{34} = White	886		
X_{35} = Other	1		
Children			
X_{36} = Has Children	708		
X_{37} = No Children	954		
Class of Activity			
X_{38} = Agriculture	10		
X_{39} = Extractive	14		
X_{40} = Mfg. Industry	91		
X_{41} = Commerce and Transportation	105		
X_{42} = Service Industries	6		
X_{43} = Government or Other	248		
X_{44} = Liberal Professions	388		
X_{45} = Social Services	181		
Position			
X_{46} = Public Employee	385		
X_{47} = Employer or Own Account	402		
X_{48} = Private Employee	190		
Migration			
X_{49} = ... Migration	377		
X_{50} = ... Rural	39		
X_{51} = From Urban	886		
Environment			
X_{52} = Urban	880		
X_{53} = Suburban	88		
X_{54} = Rural	78		
Analysis of Variance			
a^{th} Value		13.88888	19.80861
R^2 ($\bar{R}^2$)		.17088 (.15927)	.18497 (.14725)
Std. Error of Estimate		0.88866	0.88788

TABLE 78

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL UNIVERSITY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 15 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Inc.	Regression nº Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	161												
z_4 - 4 years	289												
z_5 - 5 years	365												
z_6 - 6 years	136												
Age													
z_7 - 19 years midpoint	1	Intercept 3.42868					30,845						
z_8 - 22 " "	20	0.04075	-0.10068	-0.44807	0.13669	-3.28101	19,745						
z_9 - 27 " "	188	0.19018	-0.13644	-0.31482	0.07181	-4.40237	22,813						
z_{10} - 32 " "	238	0.24869	0.03947	-0.03689	0.06828	-0.55689	29,728						
z_{11} - 39 " "	248	Intercept 3.42868					30,845						
z_{12} - 49 " "	156	0.16901	0.07572	0.06436	0.07471	0.72747	32,548						
z_{13} - 59 " "	61	0.06374	-0.04106	-0.17765	0.10604	-1.69124	25,825						
z_{14} - 68 " "	32	0.03344	0.00132	-0.08272	0.13756	-0.36396	29,861						
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	82												
z_{17} - Medicine	136												
z_{18} - Pharmacy	67												
z_{19} - Dentistry	108												
z_{20} - Engineering	119												
z_{21} - Law	220												
z_{22} - Agronomy	41												
z_{23} - Econ./Pol. Science	76												
z_{24} - All other courses completed													
[illegible]	130												
Sex													
z_{25} - Female	48												
z_{26} - Male	936												

x_{27} - Not Head	121							
x_{28} - Head	886							
Religion								
x_{29} - Protestant	121							
x_{30} - Jewish	5							
x_{31} - Other	79							
x_{32} - Roman Catholic	744							
Race								
x_{33} - Black	1							
x_{34} - White	988							
x_{35} - Other	1							
Children								
x_{36} - Has Children	708							
x_{37} - No Children	964							
Class of Activity								
x_{38} - Agriculture	10	0.01048	-0.03031	-0.36319	0.93587	-1.53948	21,458	
x_{39} - Extractive	14	0.01463	0.08756	0.36821	0.40078	1.80442	44,309	
x_{40} - Mfg. Industry	91	0.09509	-0.01553	-0.16788	0.09001	-1.86825	26,078	
x_{41} - Commerce and Transportation	105	0.10972	-0.07956	-0.31884	0.08536	-3.73507	28,421	
x_{42} - Service Industries	6	0.00627	-0.09071	-0.91765	0.30368	-3.02437	19,321	
x_{43} - Government or Other	242	Intercept	3.41898				30,845	
x_{44} - Liberal Professions	336	0.35119	0.06863	-0.06851	0.06183	-0.94477	29,098	
x_{45} - Social Services	181	0.18778	-0.11011	-0.34876	0.07896	-4.59188	21,788	
Position								
x_{46} - Public Employee	365							
x_{47} - Employer or Own Account . .	402							
x_{48} - Private Employee	190							
Migration								
x_{49} - No Migration	377							
x_{50} - From Rural	88							
x_{51} - From Urban	536							
Environment								
x_{52} - Urban	880							
x_{53} - Suburban	88							
x_{54} - Rural	78							
Analysis of Variance								
"F" Value					6.88508			
R^2 ($\bar{R}^2$)					.08894	(.07088)		
Std. Error of Estimate . . .					0.78810			

SANTA CATARINA - AGE/INCOME PROFILES - 1960

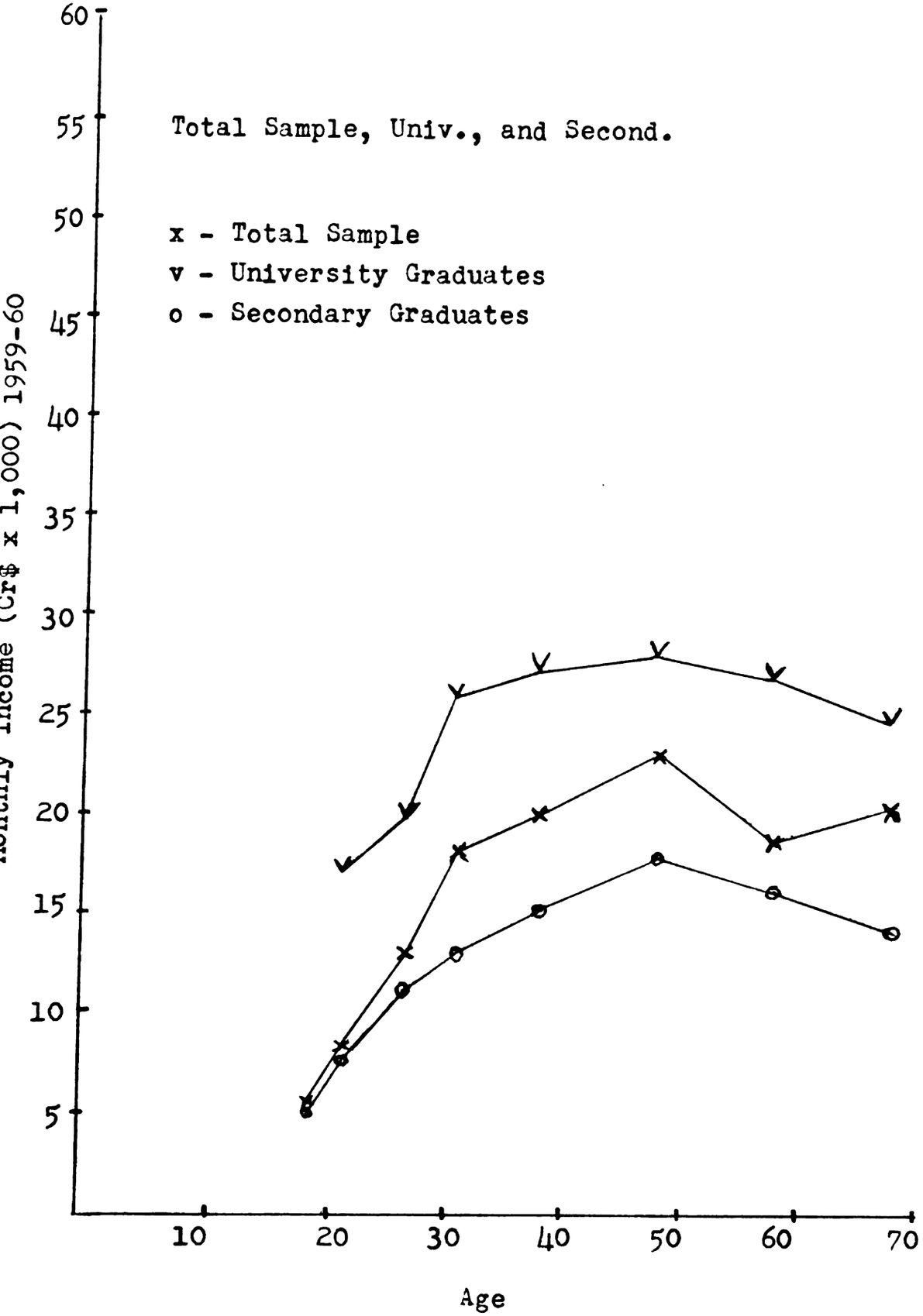


Fig. 57

of variables used in the study. Age explains about three percent of variance; Years Completed, 12.5 percent; Course Completed, fourteen percent; Sex, eight percent; Head of Family, five percent; Religion, less than one-half percent; Race, no significant amount but the non-white population of two persons out of 957 is minuscule. Children account for three percent of variance; Class of Activity, four percent; Position, two percent; Migration, two-tenths of one percent; and Environment, less than two percent. Joint regressions of Age and Course Completed, Age and Years Completed, and Age and Class of Activity indicate only slight interaction between these combinations.

Within the classes of variables, there are many income differences significant at a level of ninety percent or more. All Courses Completed earn more than Philosophy and their ranking is as follows:

1. Medicine
2. Engineering
3. Law
4. Others
5. Agronomy
6. Economic/Political Science
7. Dentistry
8. Pharmacy
9. Philosophy

ale, Head of Family, and Has Children are variables consistent with incomes higher than their counterparts. Protestants earn less than persons with any other religion. The non-white population is too small for evaluation. The following ranking of log income applies to Class of Activity.

1. Extractive Industries
2. Government
3. Liberal Professions
4. Manufacturing Industries
5. Communication/ Transportation
6. Social Services
7. Agriculture
8. Service Industries

Private Employees earn less than either Public Employees or Employers. Migrants from rural areas have lower incomes than persons without a migration history or those migrating from urban areas. Rural residents' incomes are lower than those of either suburban or urban dwellers.

All Secondary Graduates.--Table 79 gives the results of regressions of log income for the sample of All Secondary Graduates. Age explains 17.5 percent of variance; Sex, 20.0 percent; Head of Family, 23.4 percent; Religion, 1.5 percent; Race, none; Children, 14.2 percent; Class of Activity, 16.7 percent, Position, 9.0 percent; Migration, 1.5 percent; and Environment, 1.9 percent, and all variables together, 38.5 percent.

Among college drop-outs, those with four or five years of university but without degrees have significantly greater earnings than those with one, two or three years. Males earn double the amount earned by Females, as is the case for Heads of Family and those with children when compared to their counterparts. Unlike the university group, Roman Catholics earn less than any of the other religious groups. Non-whites earn less than Whites, but the sample of non-whites is very small. The ranking of log income by Class of Activity is as follows:

1. Extractive Industries
2. Manufacturing Industries
3. Communication/ Transportation
4. Government
5. Liberal Professions
6. Service Industries
7. Agriculture
8. Social Services

TABLE 79

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	87							Intercept	2.41631				11,204
z_2 - 2 years	98							0.01250	-0.03763	-0.41158	0.15831	-1.55550	8,600
z_3 - 3 years	26							0.01477	-0.01075	-0.06257	0.14303	-0.43749	10,525
z_4 - 4 years	14							0.00798	0.04837	0.38270	0.19423	2.02181	16,593
z_5 - 5 years	8							0.00284	0.04957	0.67439	0.34415	2.08047	21,992
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	61	0.03466	-0.19809	-1.06668	0.09286	-11.48729	8,266						
z_8 - 22 " "	675	0.36969	-0.29660	-0.66242	0.04920	-13.46322	7,675						
z_9 - 27 " "	467	0.26534	-0.00180	-0.31017	0.04936	-6.28377	11,900						
z_{10} - 32 " "	266	0.15114	0.09007	-0.15396	0.05602	-2.74806	13,094						
z_{11} - 39 " "	288	Intercept	2.72612				15,274						
z_{12} - 49 " "	117	0.04648	0.17284	0.15923	0.07223	2.20458	17,910						
z_{13} - 59 " "	70	0.03977	0.10678	0.06799	0.08779	0.77444	16,348						
z_{14} - 68 " "	16	0.00909	0.03072	-0.07830	0.16972	-0.46032	14,153						
Course Completed													
z_{15} - Secondary	1,760												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	4												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	574												
z_{26} - Male	1,186												

. . . . .	948		
Religion			
z_{29} - Protestant	281		
z_{30} - Jewish	4		
z_{31} - Other	81		
z_{32} - Roman Catholic	1,444		
Race			
z_{33} - Black	13		
z_{34} - White	1,748		
z_{35} - Other	8		
Children			
z_{36} - Has Children	944		
z_{37} - No Children	816		
Class of Activity			
z_{38} - Agriculture	20		
z_{39} - Extractive	34		
z_{40} - Mfg. Industry	176		
z_{41} - Commerce and Transportation	431		
z_{42} - Service Industries	40		
z_{43} - Government or Other	238		
z_{44} - Liberal Professions	903		
z_{45} - Social Services	898		
Position			
z_{46} - Public Employee	730		
z_{47} - Employer or Own Account . .	306		
z_{48} - Private Employee	723		
Migration			
z_{49} - No Migration	912		
z_{50} - From Rural	77		
z_{51} - From Urban	769		
Environment			
z_{52} - Urban	1,493		
z_{53} - Suburban	116		
z_{54} - Rural	161		
Analysis of Variance			
"F" Value		84.21101	8.77809
R^2 ($\bar{R}^2$)		.17808 (.17522)	.00839 (.00461)
Std. Error of Estimate . . .		0.68681	0.78276

TABLE 79

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 3						Regression nº 4					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Leg.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Leg.Inc.
Years of University Completed													
x_1 - 1 year	97												
x_2 - 2 years	92												
x_3 - 3 years	96												
x_4 - 4 years	14												
x_5 - 5 years	8												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	61												
x_8 - 22 " "	678												
x_9 - 27 " "	467												
x_{10} - 32 " "	266												
x_{11} - 39 " "	288												
x_{12} - 49 " "	117												
x_{13} - 59 " "	70												
x_{14} - 68 " "	18												
Course Completed													
x_{15} - Secondary	1,780												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	574	0.39614	-0.44280	-0.68288	0.03308	-20.67190	7,076						
x_{26} - Male	1,186	Intercept		2.64044			14,018						

		Head of Family	
		0.46126 -0.48478 -0.70498 0.00025 -22.70688 7.676	
		Intercept 9.76926	15.988
		Religion	
x_{29} - Protestant	921		
x_{30} - Jewish	4		
x_{31} - Other	81		
x_{32} - Roman Catholic	1,444		
		Race	
x_{33} - Black	13		
x_{34} - White	1,702		
x_{35} - Other	5		
		Children	
x_{36} - Has Children	944		
x_{37} - No Children	816		
		Class of Activity	
x_{38} - Agriculture	30		
x_{39} - Extractive	34		
x_{40} - Mfg. Industry	176		
x_{41} - Commerce and Transportation	452		
x_{42} - Service Industries	40		
x_{43} - Government or Other	220		
x_{44} - Liberal Professions	288		
x_{45} - Social Services	288		
		Position	
x_{46} - Public Employee	720		
x_{47} - Employer or Own Account . .	308		
x_{48} - Private Employee	722		
		Migration	
x_{49} - No Migration	918		
x_{50} - From Rural	77		
x_{51} - From Urban	760		
		Environment	
x_{52} - Urban	1,486		
x_{53} - Suburban	118		
x_{54} - Rural	161		
		Analysis of Variance	
"F" Value		427.32736	528.46688
R^2 ($\bar{R}^2$)		.19684 (.19554)	.23448 (.23448)
Std. Error of Estimate . . .		0.68068	0.63471

TABLE 79

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 5						Regression nº 6					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	97												
z_2 - 2 years	88												
z_3 - 3 years	26												
z_4 - 4 years	14												
z_5 - 5 years	8												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	61												
z_8 - 22 " "	478												
z_9 - 27 " "	467												
z_{10} - 32 " "	266												
z_{11} - 39 " "	288												
z_{12} - 49 " "	117												
z_{13} - 59 " "	70												
z_{14} - 68 " "	16												
Course Completed													
z_{15} - Secondary	1,700												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Fol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	574												
z_{26} - Male	1,126												

Head of Family			
x_{27} - Not Head	812		
x_{28} - Head	948		
Religion			
x_{29} - Protestant	931	0.13125 0.07241 0.17196 0.06103 3.86953 12,830	
x_{30} - Jewish	4	0.00727 0.06790 1.06830 0.36068 2.96275 31,463	
x_{31} - Other	81	0.04602 0.06711 0.75841 0.09723 3.14248 13,990	
x_{32} - Roman Catholic	1,644	Intercept 2.38081	10,810
Race			
x_{33} - Black	13		0.00739 -0.33216 -0.97316 0.80185 -1.35867 8,969
x_{34} - White	1,748		Intercept 9.49027 11,949
x_{35} - Other	8		0.00784 -0.02183 -0.99936 0.37473 -0.92187 8,389
Children			
x_{36} - Has Children	944		
x_{37} - No Children	816		
Class of Activity			
x_{38} - Agriculture	20		
x_{39} - Extractive	24		
x_{40} - Mfg. Industry	178		
x_{41} - Commerce and Transportation	421		
x_{42} - Service Industries	40		
x_{43} - Government or Other	229		
x_{44} - Liberal Professions	223		
x_{45} - Social Services	208		
Position			
x_{46} - Public Employee	720		
x_{47} - Employer or Own Account	208		
x_{48} - Private Employee	736		
Migration			
x_{49} - No Migration	912		
x_{50} - From Rural	77		
x_{51} - From Urban	788		
Environment			
x_{52} - Urban	1,488		
x_{53} - Suburban	116		
x_{54} - Rural	161		
Analysis of Variance			
"F" Value		9.98080	1.33497
R^2 ($\bar{R}^2$)		.01558 (.01457)	.00188 (.00072)
Std. Error of Estimate		0.78017	0.78508

TABLE 79

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 7						Regression nº 8					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Leg.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"t" Value	Antilog. Leg.Inc.
Years of University Completed													
z_1 - 1 year	97												
z_2 - 2 years	28												
z_3 - 3 years	26												
z_4 - 4 years	14												
z_5 - 5 years	6												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	61												
z_8 - 22 " "	478												
z_9 - 27 " "	467												
z_{10} - 32 " "	206												
z_{11} - 39 " "	288												
z_{12} - 49 " "	117												
z_{13} - 59 " "	70												
z_{14} - 68 " "	16												
Course Completed													
z_{15} - Secondary	1,780												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Secondary	0												
Sex													
z_{25} - Female	874												
z_{26} - Male	1,186												

								Head of Family
x_{27} - Not Head	612							
x_{28} - Head	948							
								Religion
x_{29} - Protestant	281							
x_{30} - Jewish	4							
x_{31} - Other	81							
x_{32} - Roman Catholic	1,444							
								Race
x_{33} - Black	13							
x_{34} - White	1,742							
x_{35} - Other	8							
								Children
x_{36} - Has Children	944	0.53636	0.37676	0.84777	0.03212	17,06369	14,460	
x_{37} - No Children	516	Intercept	9.12969				8,361	
								Class of Activity
x_{38} - Agriculture	30							0.01706 -0.02912 -0.28430 0.19023 -2.21636 9,868
x_{39} - Extractive	84							0.01932 0.10831 0.43588 0.12136 3.88965 19,088
x_{40} - Mfg. Industry	178							0.10000 0.16068 0.27545 0.06580 8.49634 18,907
x_{41} - Commerce and Transportation	431							0.24489 0.16684 0.09813 0.03345 1.64886 18,888
x_{42} - Service Industries	60							0.02273 0.00218 -0.11383 0.11310 -1.00379 11,984
x_{43} - Government or Other	238							Intercept 9.84130 18,096
x_{44} - Liberal Professions	285							0.16080 0.06590 -0.01475 0.03821 -0.38387 12,510
x_{45} - Social Services	220							0.30000 -0.38969 -0.86547 0.06168 -10.74918 7,888
								Position
x_{46} - Public Employee	730							
x_{47} - Employer or Own Account	306							
x_{48} - Private Employee	722							
								Migration
x_{49} - No Migration	912							
x_{50} - From Rural	77							
x_{51} - From Urban	760							
								Environment
x_{52} - Urban	1,688							
x_{53} - Suburban	116							
x_{54} - Rural	161							
								Analysis of Variance
"F" Value				290.83809				81.40706
R^2 ($\bar{R}2$)				.14186 (.14195)				.17049 (.16252)
Std. Error of Estimate				0.67197				0.66187

TABLE 79

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 9						Regression nº 10					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	87												
z_2 - 2 years	22												
z_3 - 3 years	26												
z_4 - 4 years	14												
z_5 - 5 years	8												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	61												
z_8 - 22 " "	478												
z_9 - 27 " "	467												
z_{10} - 32 " "	366												
z_{11} - 39 " "	288												
z_{12} - 49 " "	117												
z_{13} - 59 " "	70												
z_{14} - 68 " "	18												
Course Completed													
z_{15} - Secondary	1,700												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	674												
z_{26} - Male	1,126												

x_{27} - Not Read	816		
x_{28} - Read	948		
Religion			
x_{29} - Protestant	221		
x_{30} - Jewish	4		
x_{31} - Other	81		
x_{32} - Roman Catholic	1,444		
Race			
x_{33} - Black	13		
x_{34} - White	1,748		
x_{35} - Other	8		
Children			
x_{36} - Has Children	944		
x_{37} - No Children	816		
Class of Activity			
x_{38} - Agriculture	80		
x_{39} - Extractive	34		
x_{40} - Mfg. Industry	176		
x_{41} - Commerce and Transportation	431		
x_{42} - Service Industries	40		
x_{43} - Government or Other	238		
x_{44} - Liberal Professions	283		
x_{45} - Social Services	528		
Position			
x_{46} - Public Employee	730	Intercept 2.90217	9,045
x_{47} - Employer or Own Account	306	0.17386 0.28001 0.61035 0.04713 12.96164	16,652
x_{48} - Private Employee	785	0.41060 0.05802 0.26841 0.03630 7.31654	11,796
Migration			
x_{49} - No Migration	912		0.51618 -0.09588 -0.16868 0.02628 -4.70430 10,492
x_{50} - From Rural	77		0.04378 -0.06863 -0.29760 0.08604 -3.45902 9,196
x_{51} - From Urban	789		Intercept 2.51697 12,288
Environment			
x_{52} - Urban	1,483		
x_{53} - Suburban	116		
x_{54} - Rural	161		
Analysis of Variance			
"F" Value		87.12348	14.12861
R^2 (R2)		.08068 (.08978)	.01303 (.01528)
Std. Error of Estimate		0.09812	0.71287

TABLE 79

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 11						Regression nº 12					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Leg.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Leg.Inc.
Years of University Completed													
x_1 - 1 year	87							Intercept	2.72337				18,838
x_2 - 2 years	52							0.01230	-0.03766	-0.15182	0.14152	-1.07276	13,086
x_3 - 3 years	26							0.01477	-0.01078	-0.02583	0.13031	-0.19818	14,843
x_4 - 4 years	14							0.00795	0.04837	0.23662	0.17708	1.34797	19,336
x_5 - 5 years	8							0.00384	0.04967	0.38481	0.29618	1.98119	27,336
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	61							0.03466	-0.19809	-1.06392	0.09292	-11.46219	5,756
x_8 - 22 " "	475							0.22969	-0.29660	-0.58637	0.04926	-13.32491	7,901
x_9 - 27 " "	467							0.22634	-0.00190	-0.31018	0.04934	-6.28692	11,170
x_{10} - 32 " "	266							0.12814	0.09007	-0.18693	0.06602	-2.80184	13,019
x_{11} - 39 " "	288							Intercept	2.72337				18,838
x_{12} - 49 " "	117							0.06648	0.17284	0.16169	0.07919	2.23088	17,906
x_{13} - 59 " "	70							0.03977	0.10575	0.06807	0.08778	0.77548	16,306
x_{14} - 68 " "	16							0.00909	0.03072	-0.07345	0.16910	-0.43434	14,153
Course Completed													
x_{15} - Secondary	1,780												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	874												
x_{26} - Male	1,186												

Head of Family				
x_{27} - Not Head	512			
x_{28} - Head	948			
Religion				
x_{29} - Protestant	951			
x_{30} - Jewish	4			
x_{31} - Other	81			
x_{32} - Roman Catholic	1,444			
Race				
x_{33} - Black	13			
x_{34} - White	1,748			
x_{35} - Other	8			
Children				
x_{36} - Has Children	944			
x_{37} - No Children	616			
Class of Activity				
x_{38} - Agriculture	80			
x_{39} - Extractive	34			
x_{40} - Mfg. Industry	178			
x_{41} - Commerce and Transportation	451			
x_{42} - Service Industries	40			
x_{43} - Government or Other	888			
x_{44} - Liberal Professions	988			
x_{45} - Social Services	888			
Position				
x_{46} - Public Employee	720			
x_{47} - Employer or Own Account	306			
x_{48} - Private Employee	728			
Migration				
x_{49} - No Migration	918			
x_{50} - From Rural	77			
x_{51} - From Urban	788			
Environment				
x_{52} - Urban	1,488	Intercept 2.48948		11,888
x_{53} - Suburban	118	0.06591 -0.05617 -0.19636 0.06929 -2.81962		9,688
x_{54} - Rural	161	0.09148 -0.12115 -0.31886 0.06965 -8.34686		8,504
Analysis of Variance				
"F" Value		17.19086		38.18788
R^2 ($\bar{R}^2$)		.01918 (.01858)		.18189 (.17662)
Std. Error of Estimate		0.71886		0.86886

TABLE 79

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
ALL SECONDARY GRADUATES (CONTINUED)

Variable Number and Description	Sample Size	Regression nº 13						Regression nº 14					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
								Intercept	9.80950				18,408
z_1 - 1 year	97							0.01980	-0.03766	-0.19655	0.12378	-1.58458	13,639
z_2 - 2 years	28							0.01477	-0.01075	-0.06187	0.11333	-0.54578	18,610
z_3 - 3 years	26							0.00796	0.04837	0.40092	0.18497	0.65417	18,364
z_4 - 4 years	14							0.00884	0.04987	0.36247	0.25609	1.49351	24,336
z_5 - 5 years	5												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	61	0.03466	-0.19809	-0.97698	0.08532	-11.45131	9,817	0.03466	-0.19809	-0.80410	0.08650	-8.98358	9,074
z_8 - 22 " "	478	0.28989	-0.29660	-0.82836	0.04531	-13.73510	9,291	0.28989	-0.29660	-0.32268	0.05034	-6.40867	12,023
z_9 - 27 " "	467	0.26534	-0.00190	-0.30794	0.04532	-6.79819	12,723	0.26534	-0.00190	-0.16813	0.04473	-3.69183	14,075
z_{10} - 32 " "	266	0.15114	0.09007	-0.14239	0.05142	-2.76924	15,014	0.15114	0.09007	-0.10514	0.04878	-2.15532	14,945
z_{11} - 39 " "	268	Intercept	9.85139				17,312	Intercept	9.80950				18,408
z_{12} - 49 " "	117	0.08648	0.17224	0.09083	0.06637	1.36882	18,958	0.08648	0.17224	0.06421	0.06284	0.86467	17,526
z_{13} - 59 " "	70	0.03977	0.10575	0.03018	0.08050	0.37468	17,842	0.03977	0.10575	-0.05641	0.07586	-0.73396	15,691
z_{14} - 68 " "	16	0.00909	0.03079	-0.15105	0.19515	-0.97366	14,966	0.00909	0.03079	-0.22786	0.14642	-1.53843	13,218
Course Completed													
z_{15} - Secondary	1,760												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	574							0.32614	-0.44180	-0.80399	0.04746	-4.89824	13,536
z_{26} - Male	1,186							Intercept	9.80950				18,408

z_{27} - Not Head	819						0.46136	-0.48423	-0.44412	0.08999	-0.10048	12,988
z_{28} - Head	948						Intercept	2.80980				16,002
Religion												
z_{29} - Protestant	981						0.13186	0.07941	0.01680	0.04980	0.28114	16,978
z_{30} - Jewish	4						0.00227	0.06790	0.71706	0.28706	2.48087	38,987
z_{31} - Other	81						0.04602	0.06711	0.14981	0.04612	2.15648	19,164
z_{32} - Roman Catholic	1,444						Intercept	2.80980				16,002
Race												
z_{33} - Black	13						0.00739	-0.03218	0.04625	0.16082	0.28804	17,987
z_{34} - White	1,748						Intercept	2.80980				16,002
z_{35} - Other	8						0.00884	-0.02183	-0.26387	0.25469	-1.02796	12,781
Children												
z_{36} - Has Children	944						0.53636	0.37676	0.15086	0.03585	4.20880	19,206
z_{37} - No Children	816						Intercept	2.80980				16,002
Class of Activity												
z_{38} - Agriculture	30	0.01708	-0.02912	-0.41928	0.11775	-3.57599	11,383	0.01708	-0.02912	-0.47738	0.12126	-3.93686	10,300
z_{39} - Extractive	34	0.01932	0.10831	0.34253	0.11099	3.08607	94,384	0.01932	0.10831	0.31896	0.11262	2.83861	22,085
z_{40} - Mfg. Industry	176	0.10000	0.16062	0.18747	0.06009	2.69067	90,264	0.10000	0.16062	0.12986	0.06954	1.86790	18,085
z_{41} - Commerce and Transportation	431	0.24469	0.16654	0.07054	0.04875	1.44684	18,877	0.24469	0.16654	0.04408	0.05880	0.74967	17,360
z_{42} - Service Industries	40	0.02273	0.00218	-0.21686	0.10534	-2.09266	13,945	0.02273	0.00218	-0.26476	0.10700	-2.47446	12,760
z_{43} - Government or Other	238	Intercept	2.86130				17,312	Intercept	2.80980				16,002
z_{44} - Liberal Professions	283	0.16060	0.06590	-0.04470	0.06513	-0.84122	16,555	0.16060	0.06590	-0.10128	0.06557	-1.54458	15,002
z_{45} - Social Services	328	0.30000	-0.38969	-0.51727	0.04716	-10.96835	10,320	0.30000	-0.38969	-0.30348	0.06140	-5.90469	12,796
Position												
z_{46} - Public Employee	730							Intercept	2.80980			16,002
z_{47} - Employer or Own Account	306							0.17386	0.76001	0.13611	0.06048	9.73414	19,006
z_{48} - Private Employee	788							0.41960	0.06808	-0.06896	0.04944	-1.79931	15,188
Migration												
z_{49} - No Migration	912						0.51818	-0.09556	0.00796	0.02881	0.98119	16,788
z_{50} - From Rural	77						0.04375	-0.05863	-0.04134	0.06986	-0.89496	15,989
z_{51} - From Urban	799						Intercept	2.80980				16,002
Environment												
z_{52} - Urban	1,483						Intercept	2.80980				16,002
z_{53} - Suburban	116						0.06591	-0.06617	-0.18373	0.06538	-2.77563	14,236
z_{54} - Rural	161						0.09148	-0.12115	-0.21939	0.04911	-4.46721	13,281
Analysis of Variance												
"F" Value				57.00985						38.98508		
R^2 ($\bar{R}^2$)				.31894 (.30874)						.36854 (.38450)		
Std. Error of Estimate				0.60314						0.86918		

Employers and Self-Employed persons earn more than Private Employees who, in turn, earn more than Public Employees. Persons with a history of migration from an urban area have incomes higher than those without a migration history as well as those that migrated from rural areas. The ranking of incomes by current environment follows the normal pattern of Urban, high; Suburban, middle; and Rural, low; with significant differences between each group.

Most of the professional sub-samples from Santa Catarina have such small numbers of observations as to make significant results rare. The cell means (geometric) are still accurately calculated but their usefulness in predicting is limited by substantial standard errors in most cases. Only those differences significant at a level of ninety percent or more are noted in the presentation that follows. Nevertheless, the trends indicated by the cell means are of interest and taken with the results from other states, they contribute to aggregate trends that are discussed in Chapted IV.

Philosophy Graduates.--The only variable producing a significant income difference is that of Private Employee which is consistent with lower income than either of the other two Position categories (see Table 80). The level of income for Philosophy graduates is generally lower than that of secondary graduates of similar age groups from Santa Catarina as is shown graphically in Figure 58.

TABLE 80

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF PHILOSOPHY

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Leg.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antileg. Leg.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	8							Intercept	0.00000				1,000
z_4 - 4 years	47							0.90388	0.38801	-0.47099	0.46037	-1.02307	624
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	3	0.08769	-0.04338	0.07690	0.67411	0.03849	11,936	0.08769	-0.04338	-0.54759	0.67818	-0.80744	578
z_9 - 27 " "	7	0.13462	-0.00936	0.17587	0.49671	0.36346	13,049	0.13462	-0.00936	-0.89115	0.57851	-0.80329	747
z_{10} - 32 " "	10	0.19231	0.01884	0.23614	0.44790	0.52803	13,864	0.19231	0.01884	-0.77701	0.41674	-0.66471	758
z_{11} - 39 " "	9	Intercept		2.39318			10,948	Intercept		0.00000			1.000
z_{12} - 49 " "	15	0.28846	0.01637	0.24468	0.40453	0.55543	13,706	0.28846	0.01637	-0.14806	0.38296	-0.37092	868
z_{13} - 59 " "	6	0.11538	0.14130	0.58619	0.52419	1.12456	19,675	0.11538	0.14130	0.36865	0.53604	0.66348	1,437
z_{14} - 68 " "	2	0.03846	-0.00080	0.19608	0.79759	0.24589	13,307	0.03846	-0.00080	-0.51883	0.78040	-0.66231	596
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	88												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{25} - Female	10							0.19231	-0.08809	-0.98406	0.44691	-1.83065	806
z_{26} - Male	68							Intercept		0.00000			1.000

			0.23077	-0.07067	-0.04274	0.38518		1.000
			Intercept	0.00000				
x_{27} - Not Head	12							
x_{28} - Head	40							
Religion								
x_{29} - Protestant	6		0.11538	0.01388	0.24994	0.47903	0.98081	1.983
x_{30} - Jewish	0							
x_{31} - Other	3		0.05769	0.15062	0.18168	0.58999	0.30798	1.199
x_{32} - Roman Catholic	43		Intercept	0.00000				1.000
Race								
x_{33} - Black	1		0.01923	0.03490	0.72130	0.76630	0.94138	2.097
x_{34} - White	50		Intercept	0.00000				1.000
x_{35} - Other	1		0.01923	0.03490	0.72783	0.86105	0.98458	1.286
Children								
x_{36} - Has Children	25		0.44231	0.32164	0.10227	0.87011	0.97883	1.108
x_{37} - No Children	29		Intercept	0.00000				1.000
Class of Activity								
x_{38} - Agriculture	0							
x_{39} - Extractive	0							
x_{40} - Mfg. Industry	3		0.05769	-0.04388	3.10401	0.93681	3.81338	28.287
x_{41} - Commerce and Transportation	5		0.09615	0.24879	3.80215	1.00698	3.18330	24.588
x_{42} - Service Industries	0							
x_{43} - Government or Other	8		0.15385	0.26380	3.74871	0.88839	4.59831	42.496
x_{44} - Liberal Professions	0							
x_{45} - Social Services	36		0.69231	-0.03879	3.76548	0.69936	4.66921	29.195
Position								
x_{46} - Public Employee	18		Intercept	0.00000				1.000
x_{47} - Employer or Own Account	4		0.07692	0.25745	0.38668	0.91719	0.42379	1.478
x_{48} - Private Employee	30		0.57692	-0.18433	-0.53072	0.32596	-1.62816	588
Migration								
x_{49} - No Migration	15		0.28846	0.28394	0.50761	0.32416	1.56694	1.661
x_{50} - From Rural	1		0.01923	0.30417	1.37982	1.15375	1.19694	3.974
x_{51} - From Urban	36		Intercept	0.00000				1.000
Environment								
x_{52} - Urban	44		Intercept	0.00000				1.000
x_{53} - Suburban	3		0.05769	0.35829	-0.15464	0.67438	-0.23001	897
x_{54} - Rural	5		Intercept	0.00000				1.000
Analysis of Variance								
"F" Value		0.28601				3.82606		
R^2 ($\bar{R}^2$)		.08980 (<0)				.72664 (.5927)		
Std. Error of Estimate		1.04488				0.70287		

SANTA CATARINA - AGE/INCOME PROFILES - 1960

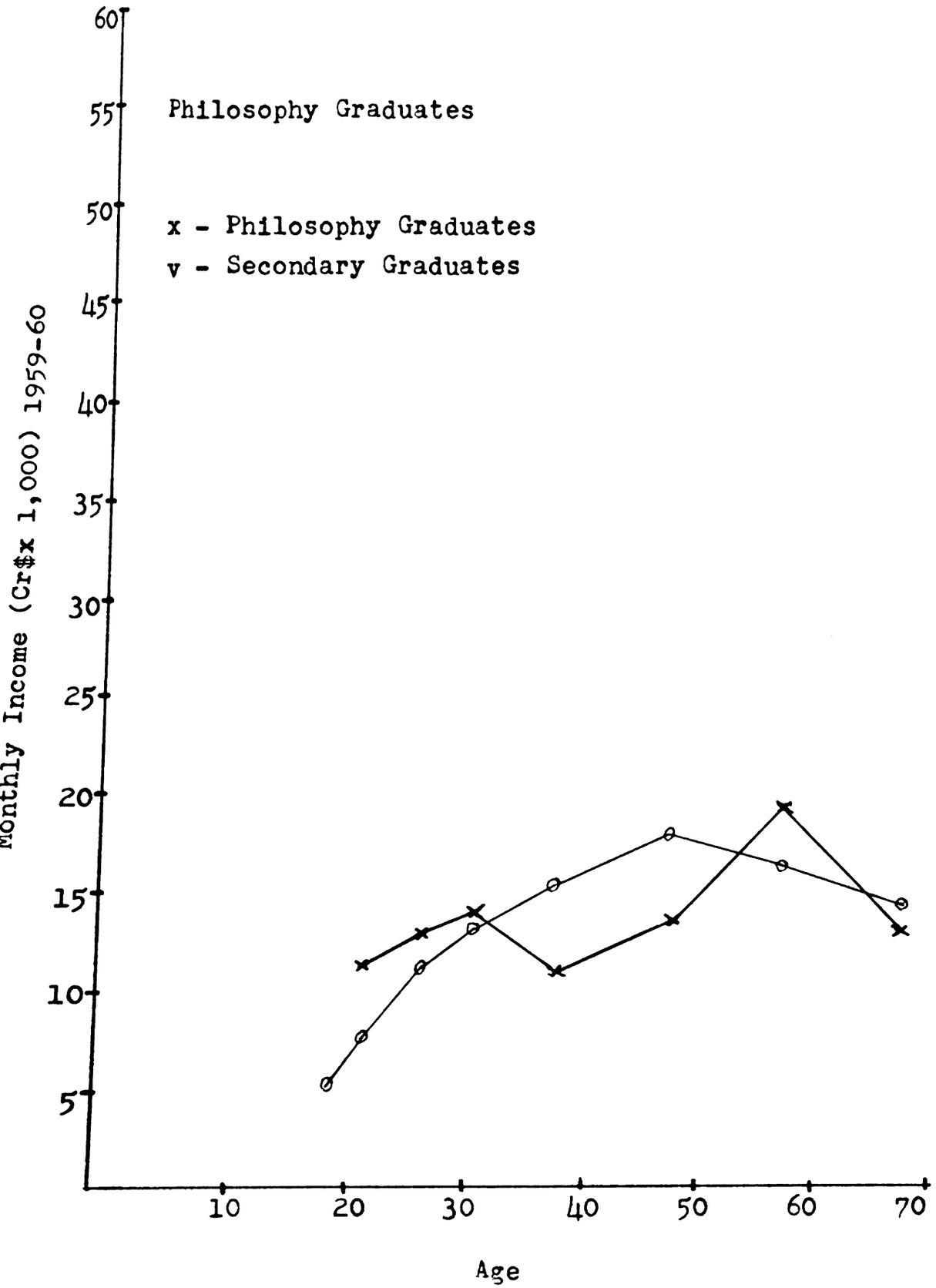


Fig. 58

Medicine.--The only significant variable in this group :hat of Commerce and Transportation within which the two duates of Medicine earned less than graduates in other sses of Activity (Table 81). The age-income profile in ure 59 is erratic--probably because of the small popula- n. A trend line, however, would show the same early irement pattern as is found in Espírito Santo and the th Region.

Pharmacy.--The variables of Private Employee and nale are both identified with low incomes compared to the her variables in their classes for Pharmacy graduates. A ry small amount of income variance is explained by the riables used for this sub-sample ($\bar{R}^2$ = .025). Regression esults and age-income profile for this group are found in able 82 and Figure 60.

Dentistry.--Among Dentistry graduates, those with hildren earn more than those without. One graduate in xtractive Industry (no pun intended) and one in Manufac- turing earn more than other Classes of Activity and the nine persons in Social Service earn significantly less than all the other classes. Public Employees rank highest in earnings followed by Employers, who were followed by Private Employees. Table 83 and Figure 61 apply to this sub-sample.

Engineering.--Variables producing significant income differences in regressions using this sub-sample are Female (one only in the sub-sample) less than Males, non-Heads of Family less than Heads of Family, Extractive Industry more

TABLE 81

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF MEDICINE

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Regression nº 2 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	0												
x_6 - 6 years	126												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	1	0.00736	-0.01884	-0.13063	0.65467	-0.19953	38,000	0.00736	-0.01884	-0.26491	0.66187	-0.40025	29,760
x_9 - 27 " "	19	0.13971	-0.11531	-0.17633	0.17838	-0.98903	33,436	0.13971	-0.11531	-0.19261	0.19659	-0.68366	34,311
x_{10} - 32 " "	31	0.22784	0.18702	0.15089	0.15249	1.04858	46,799	0.22784	0.18708	0.24861	0.15844	1.56911	49,734
x_{11} - 39 " "	45	Intercept	3.68597				39,884	Intercept	3.65808				38,787
x_{12} - 49 " "	28	0.18382	0.09458	0.13753	0.16277	0.84544	48,784	0.18382	0.09458	0.30089	0.16971	1.78941	58,378
x_{13} - 59 " "	11	0.08088	-0.13647	-0.28659	0.21867	-1.31040	29,946	0.08088	-0.13647	-0.11914	0.22644	-0.52648	34,431
x_{14} - 68 " "	6	0.04412	-0.03807	-0.09687	0.28304	-0.34547	36,902	0.04412	-0.03807	0.08061	0.29938	0.04888	39,898
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	126												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	0												
x_{26} - Male	126												

Head of Family								
x_{27} - Not Head	8		0.05882	-0.06467	-0.05286	0.04880	-1.01576	30,198
x_{28} - Head	188		Intercept	3.68808				38,787
Religion								
x_{29} - Protestant	11		0.08088	-0.00348	-0.00078	0.90814	-0.00361	38,788
x_{30} - Jewish	1		0.09735	0.12180	0.88028	0.08804	1.25888	88,048
x_{31} - Other	8		0.05882	-0.09488	-0.14488	0.88784	-0.84181	38,884
x_{32} - Roman Catholic	118		Intercept	3.68808				38,787
Race								
x_{33} - Black	0							
x_{34} - White	188							
x_{35} - Other	0							
Children								
x_{36} - Has Children	108		0.79412	0.03416	-0.06063	0.16183	-0.37536	38,808
x_{37} - No Children	88		Intercept	3.68808				38,787
Class of Activity								
x_{38} - Agriculture	0							
x_{39} - Extractive	1		Intercept	3.68808				38,787
x_{40} - Mfg. Industry	0							
x_{41} - Commerce and Transportation	8		0.01471	-0.84881	-1.31848	0.58788	-8.44880	10,488
x_{42} - Service Industries	0							
x_{43} - Government or Other	8		Intercept	3.68808				38,787
x_{44} - Liberal Professions	84		0.41765	0.09767	0.00438	0.30248	0.01449	38,887
x_{45} - Social Services	41		0.30147	0.00809	-0.04838	0.87088	-0.17088	87,088
Position								
x_{46} - Public Employee	20		Intercept	3.68808				38,787
x_{47} - Employer or Own Account	94		0.09118	0.11468	0.15788	0.80087	0.78628	48,417
x_{48} - Private Employee	12		0.08824	0.03340	0.18478	0.83674	0.65368	48,879
Migration								
x_{49} - No Migration	48		0.30882	-0.12848	-0.17818	0.18836	-1.30388	38,888
x_{50} - From Rural	4		0.08941	-0.08887	-0.38788	0.33888	-0.88830	88,818
x_{51} - From Urban	80		Intercept	3.68808				38,787
Environment								
x_{52} - Urban	184		Intercept	3.68808				38,787
x_{53} - Suburban	5		0.03676	0.08186	0.13680	0.80880	0.44880	44,429
x_{54} - Rural	7		0.06147	-0.17878	-0.20380	0.87247	-1.11877	88,648
Analysis of Variance								
"F" Value		1.12888				1.20408		
R^2 ($\bar{R}^2$)		.04068 (.01310)				.18487 (.05134)		
Std. Error of Estimate		0.64719				0.62488		

SANTA CATARINA - AGE/INCOME PROFILES - 1960

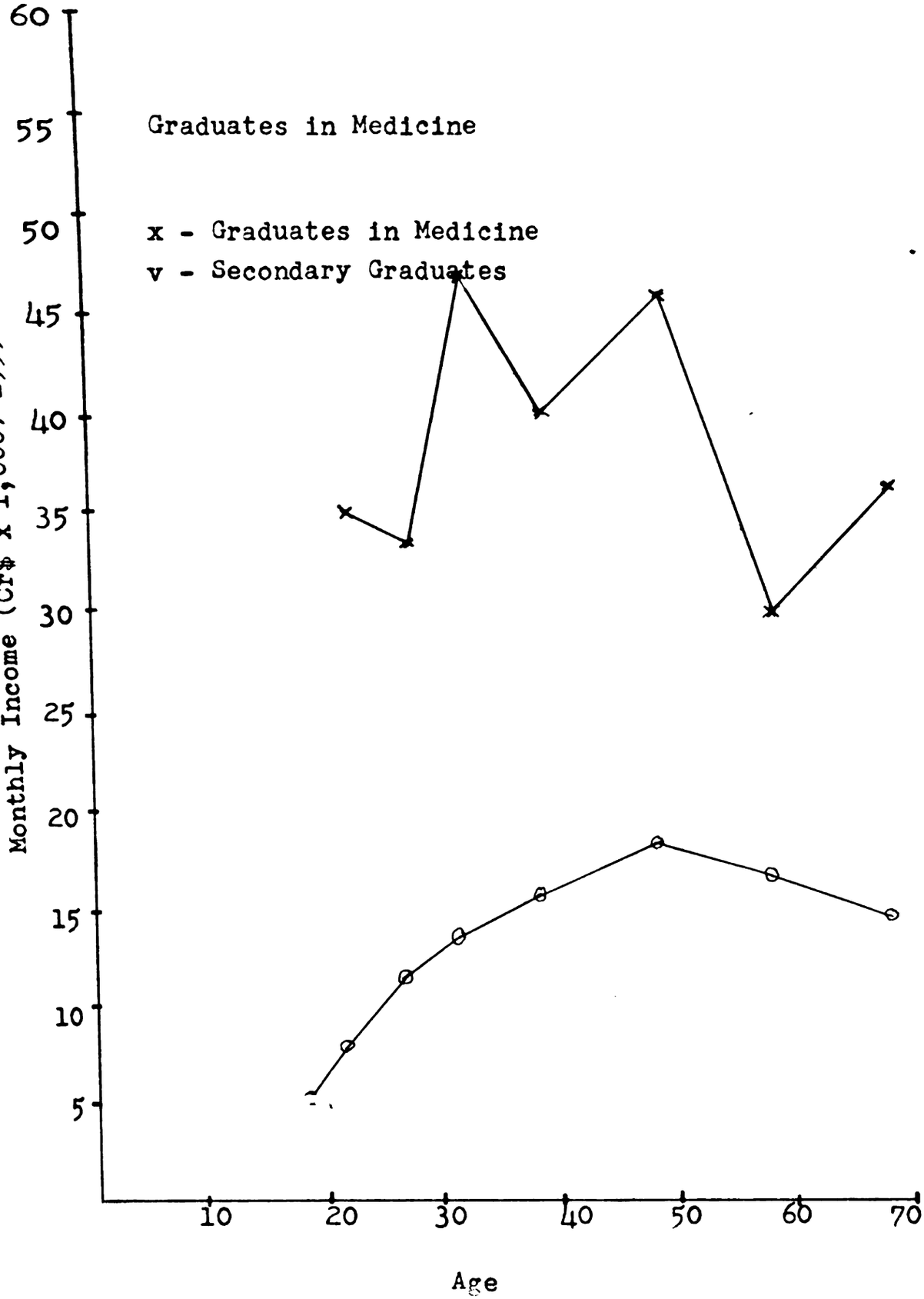


Fig. 59

TABLE 82

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF PHARMACY

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	34							Intercept	3.6H088				30,895
z_4 - 4 years	33							0.4C884	-0.06931	-0.06024	0.20067	-0.30036	28,806
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	3	0.04478	-0.04227	-0.23855	0.46068	-0.50465	15,000	0.04478	-0.04227	-0.71158	0.61436	-1.15825	15,018
z_9 - 27 " "	20	0.29851	-0.18454	-0.29301	0.26555	-1.10389	14,190	0.29851	-0.18454	-0.34984	0.31957	-1.09473	21,563
z_{10} - 32 " "	11	0.16418	-0.04618	-0.17291	0.30167	-0.57316	15,982	0.16418	-0.04618	-0.38807	0.34530	-0.36011	28,038
z_{11} - 39 " "	11	Intercept	2.94060				18,987	Intercept	3.48068				30,896
z_{12} - 49 " "	16	0.23881	0.11768	0.04691	0.27711	0.16928	19,836	0.23881	0.11768	0.11756	0.31709	0.37076	34,411
z_{13} - 59 " "	2	0.01985	0.07354	0.19110	0.54388	0.38136	28,913	0.01985	0.07354	0.06340	0.57359	0.09310	28,873
z_{14} - 68 " "	4	0.06970	0.10563	0.29110	0.41306	0.44861	28,913	0.06970	0.10563	0.01139	0.48316	0.02612	30,945
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	67												
z_{19} - Dentistry	0												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Pol. Science	0												
z_{24} - All other courses completed through Seminary	0												
Sex													
z_{25} - Female	0							0.11940	-0.09213	-0.09969	0.26969	-0.45287	18,441
z_{26} - Male	50							Intercept	3.48068				30,896

x_{27} - Not Head	19		0.17910	-0.16125	0.21582	0.33940	0.66600	37,988
x_{28} - Head	86		Intercept	8.49088				30,896
Religion								
x_{29} - Protestant	19		0.17910	0.00699	0.03971	0.86000	0.14712	31,884
x_{30} - Jewish	2		0.08966	0.18718	0.68966	0.84019	1.18548	87,419
x_{31} - Other	6		0.08966	-0.09230	-0.13406	0.89768	-0.89700	36,787
x_{32} - Roman Catholic	67		Intercept	8.49088				30,896
Race								
x_{33} - Black	0							
x_{34} - White	87							
x_{35} - Other	0							
Children								
x_{36} - Has Children	69		0.72134	0.18726	-0.22660	0.31677	-0.71868	84,889
x_{37} - No Children	18		Intercept	8.49088				30,896
Class of Activity								
x_{38} - Agriculture	0							
x_{39} - Extractive	0							
x_{40} - Mfg. Industry	7		0.10448	0.00876	0.94218	0.68646	1.87488	78,498
x_{41} - Commerce and Transportation	20		0.58209	0.10670	0.79641	0.60199	1.38489	67,848
x_{42} - Service Industries	0							
x_{43} - Government or Other	8		Intercept	8.49088				30,896
x_{44} - Liberal Professions	4		0.08970	-0.04919	0.78755	0.71937	1.09478	67,947
x_{45} - Social Services	9		0.13433	-0.80616	0.08685	0.48368	0.08868	31,417
Position								
x_{46} - Public Employee	13		Intercept	8.49088				30,896
x_{47} - Employer or Own Account	38		0.59731	0.17786	-0.98170	0.84884	-1.68033	18,178
x_{48} - Private Employee	16		0.23661	-0.28936	-1.01008	0.49965	-2.08196	11,148
Migration								
x_{49} - No Migration	31		0.46269	-0.01383	-0.11837	0.83106	-0.48833	87,348
x_{50} - From Rural	8		0.08966	-0.00648	-0.36660	0.87488	-0.63686	31,889
x_{51} - From Urban	34		Intercept	8.49088				30,896
Environment								
x_{52} - Urban	86		Intercept	8.49088				30,896
x_{53} - Suburban	7		0.10448	0.00876	0.17988	0.38290	0.81078	36,684
x_{54} - Rural	4		Intercept	8.49088				30,896
Analysis of Variance								
"F" Value		0.69690			1.00000			
R^2 ($\bar{R}^2$)		.09718 (.02819)			.38648 (.025-58)			
Std. Error of Estimate		0.70749			0.69896			

SANTA CATARINA - AGE/INCOME PROFILES - 1960

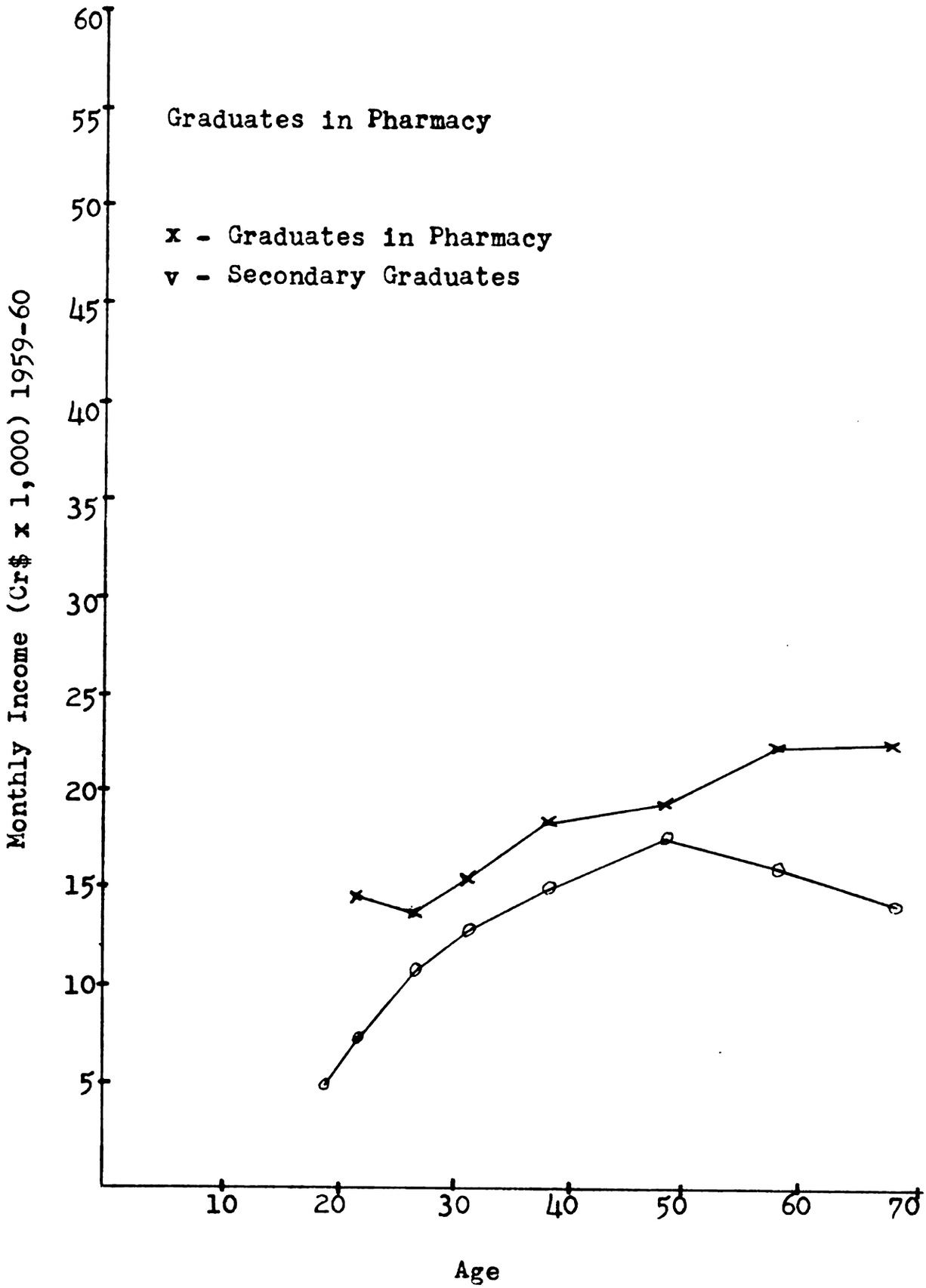


Fig. 60

TABLE 83

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF DENTISTRY

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Int.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Int.
Years of University Completed													
z_1 - 1 year	0												
z_2 - 2 years	0												
z_3 - 3 years	49							Intercept	3.28901				28,255
z_4 - 4 years	84							0.62427	0.01158	0.10626	0.11660	0.88604	26,058
z_5 - 5 years	0												
z_6 - 6 years	0												
Age													
z_7 - 19 years midpoint	0												
z_8 - 22 " "	8	0.04854	-0.13006	-0.86009	0.28901	-1.90337	13,829	0.04854	-0.13006	-0.00402	0.31964	-0.09824	28,088
z_9 - 27 " "	88	0.27184	-0.31549	-0.81422	0.17091	-3.00938	13,710	0.27184	-0.31549	-0.16938	0.15457	-0.98931	21,290
z_{10} - 32 " "	23	0.14330	0.07479	-0.18015	0.17886	-0.67408	20,334	0.22320	0.07479	-0.06589	0.16883	-0.39316	23,681
z_{11} - 39 " "	19	Intercept	3.12648				22,389	Intercept	3.28901				28,255
z_{12} - 49 " "	17	0.16806	0.18824	0.04779	0.19196	0.24894	24,062	0.16806	0.18824	0.32868	0.18446	1.78180	36,079
z_{13} - 59 " "	8	0.07787	0.04700	-0.10943	0.24234	-0.44008	20,640	0.07787	0.04700	-0.00479	0.29364	-0.07140	28,134
z_{14} - 68 " "	3	0.02913	-0.04251	-0.35148	0.35723	-0.98390	18,134	0.02913	-0.04251	-0.24467	0.28203	-0.75833	19,768
Course Completed													
z_{15} - Secondary	0												
z_{16} - Philosophy	0												
z_{17} - Medicine	0												
z_{18} - Pharmacy	0												
z_{19} - Dentistry	168												
z_{20} - Engineering	0												
z_{21} - Law	0												
z_{22} - Agronomy	0												
z_{23} - Econ./Fol. Science	0												
z_{24} - All other courses completed except Seminary	0												
Sex													
z_{27} - Female	3							0.02913	-0.04257	-0.25430	0.28015	-0.70810	19,984
z_{26} - Male	169							Intercept	3.28901				28,255

Head of Family							
x_{27} - Not Head	19						
x_{28} - Head	84		0.18447	-0.22406	-0.01907	0.17228	-0.07288	24,097
			Intercept	3.22901				22,288
Religion							
x_{29} - Protestant	23		0.21230	0.04088	-0.02178	0.12000	-0.15648	24,711
x_{30} - Jewish	0							
x_{31} - Other	9		0.08728	0.00298	0.11421	0.20004	0.07008	28,230
x_{32} - Roman Catholic	72		Intercept	3.22901				22,288
Race							
x_{33} - Black	0							
x_{34} - White	103							
x_{35} - Other	0							
Children							
x_{36} - Has Children	71		0.08032	0.40085	0.24560	0.14129	0.14288	22,084
x_{37} - No Children	32		Intercept	3.22901				22,288
Class of Activity							
x_{38} - Agriculture	0							
x_{39} - Extractive	1		0.00971	0.10288	1.22578	0.00984	1.00119	22,289
x_{40} - Mfg. Industry	1		0.00971	0.10288	1.29284	0.00700	1.02188	22,006
x_{41} - Commerce and Transportation	1		0.00971	0.10288	0.41007	0.07288	0.00048	22,057
x_{42} - Service Industries	1		0.00971	-0.00681	0.01498	0.00416	0.00199	22,026
x_{43} - Government or Other	0		Intercept	3.22901				22,288
x_{44} - Liberal Professions	84		0.21555	-0.00848	0.12557	0.20661	0.06401	20,245
x_{45} - Social Services	9		0.08738	-0.20029	-0.00697	0.22417	-0.07787	13,787
Position							
x_{46} - Public Employee	15		Intercept	3.22901				22,288
x_{47} - Employer or Own Account	20		0.77670	-0.00783	-0.00455	0.20246	-0.00726	10,617
x_{48} - Private Employee	8		0.07767	-0.27580	-1.20515	0.21020	-1.02702	6,512
Migration							
x_{49} - No Migration	81		0.09815	-0.01011	0.13029	0.12301	1.00019	22,709
x_{50} - From Rural	1		0.00971	-0.00681	-0.09780	0.23006	-0.12579	22,068
x_{51} - From Urban	21		Intercept	3.22901				22,288
Environment							
x_{52} - Urban	22		Intercept	3.22901				22,288
x_{53} - Suburban	8		0.07767	0.11134	0.25564	0.20060	1.21804	22,246
x_{54} - Rural	7		0.06796	0.00978	-0.10282	0.25659	-0.40246	22,777
Analysis of Variance								
"F" Value		2.75380			2.96180			
R^2 ($\bar{R}^2$)		.14698 (.1019K)			.07975 (.02442)			
Std. Error of Estimate		0.57800			2.42888			

SANTA CATARINA - AGE/INCOME PROFILES - 1960

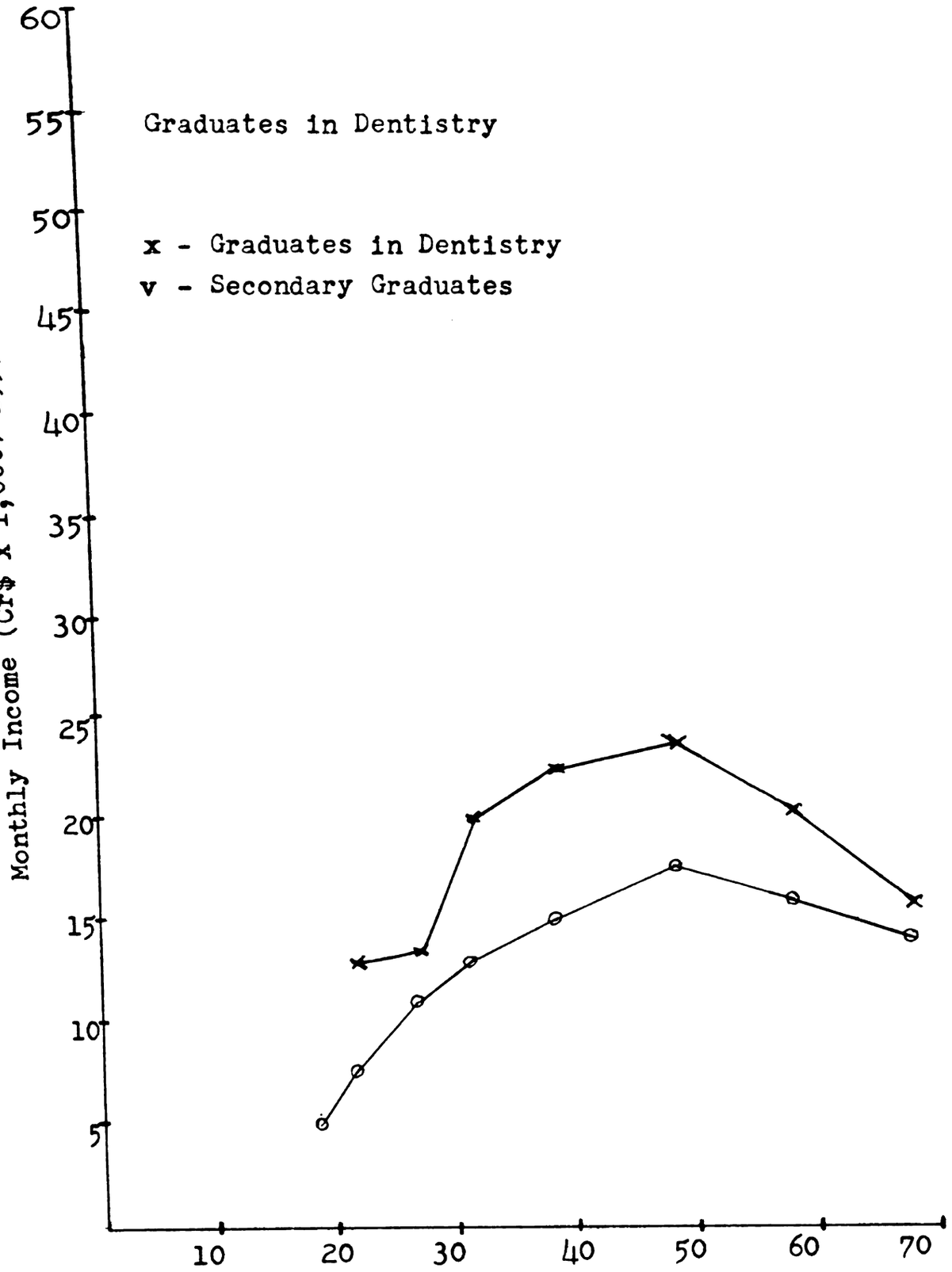


Fig. 61

ner Classes of Activity, rural migrants less than other gration categories, and rural residents less than suburban urban groups (see Table 84). The age-income profile igure 62) does not show the same pattern of high and level d-years earnings found in the other areas studied. It is imilar in the high level of earnings in the early employment ears. Again, small sub-sample population probably contribtes to the irregularity of the profile.

Law.--Table 85 and Figure 63 contain the results of regression using the sample of Law graduates. Females have lower incomes than Males, Protestants less than the other Religion categories, and Social Services less than the other Class of Activity variables. A trend line through the age-income profile produces the same earnings pattern as in the other areas studied except Guanabara.

Agronomy.--Because of the small population of this group, only the regression of Age on log income was performed. This regression and the resulting age-income profile are contained in Table 86 and Figure 64 . No explanation has been found for the extreme dip in earnings occurring in the Age 39 group other than the small cell size of the observations.

Economic and Political Sciences.--Figure 65 and Table 87 contain the results for this sub-sample. As with Agronomy, the small population size limited the calculations to the age-income relationships.

TABLE 84

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF ENGINEERING

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Regression nº 2 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed .													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	119												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	4	0.03361	-0.00695	-0.34896	0.40290	-0.90635	28,319	0.03361	-0.00695	0.15810	0.43340	0.36786	30,591
x_9 - 27 " "	18	0.12605	-0.05489	-0.45009	0.24217	-1.85853	26,034	0.12605	-0.05489	-0.21118	0.25182	-0.99732	26,373
x_{10} - 32 " "	29	0.24370	0.00675	-0.33672	0.20111	-1.65439	29,276	0.24370	0.00675	-0.13044	0.19957	-0.75373	29,168
x_{11} - 39 " "	37	Intercept	3.7v956				40,633	Intercept	3.88380				38,965
x_{12} - 49 " "	21	0.17647	-0.10718	-0.51751	0.21881	-2.36516	24,337	0.17647	-0.10718	-0.34301	0.28535	-1.61092	28,582
x_{13} - 59 " "	13	0.10924	-0.03048	-0.38563	0.25367	-1.51902	27,768	0.10924	-0.03085	-0.14955	0.25809	-0.89383	29,194
x_{14} - 68 " "	10	0.08403	-0.13965	-0.69288	0.27830	-2.48667	30,435	0.08403	-0.13965	-0.81308	0.28659	-1.77768	30,998
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	119												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	1							0.00840	-0.04286	-1.08978	0.78018	-0.88681	4,078
x_{26} - Male	118							Intercept	3.88380				38,965

x_{27} - Not Head	18		Head of Family					
x_{28} - Head	107		0.10084	-0.15266	-0.06977	0.06864	-0.06866	19,845
			Intercept	3.82260				38,066
			Religion					
x_{29} - Protestant	21		0.06060	-0.15366	-0.16446	0.17266	-0.06864	22,766
x_{30} - Jewish	0							
x_{31} - Other	0		0.06723	0.15170	0.26866	0.26761	1.84000	47,866
x_{32} - Roman Catholic	86		Intercept	3.82260				38,066
			Race					
x_{33} - Black	0							
x_{34} - White	119							
x_{35} - Other	0							
			Children					
x_{36} - Has Children	90		0.78630	0.06408	-0.07237	0.19184	-0.37786	31,886
x_{37} - No Children	29		Intercept	3.82260				38,066
			Class of Activity					
x_{38} - Agriculture	1		0.00840	-0.15662	-0.84464	0.80868	-0.07280	19,077
x_{39} - Extractive	8		0.04908	0.17878	0.88544	0.41788	1.97880	77,866
x_{40} - Mfg. Industry	37		0.31098	-0.07786	0.14080	0.24928	0.88041	39,288
x_{41} - Commerce and Transportation	6		0.08042	0.06719	0.48144	0.84801	1.06768	54,869
x_{42} - Service Industries	0							
x_{43} - Government or Other	18		Intercept	3.82260				38,066
x_{44} - Liberal Professions	46		0.38686	0.10231	0.16980	0.27818	0.60837	49,178
x_{45} - Social Services	6		0.08042	-0.06060	-0.81206	0.32804	-0.91884	24,782
			Position					
x_{46} - Public Employee	41		Intercept	3.82260				38,066
x_{47} - Employer or Own Account . .	60		0.48217	0.06881	0.14080	0.20068	0.68468	39,282
x_{48} - Private Employee	80		0.23689	0.06678	0.01818	0.22848	0.06484	34,282
			Migration					
x_{49} - No Migration	45		0.37815	0.07078	0.18181	0.18206	0.68068	38,068
x_{50} - From Rural	4		0.03361	-0.21818	-0.86096	0.48648	-0.12111	14,247
x_{51} - From Urban	68		Intercept	3.82260				38,066
			Environment					
x_{52} - Urban	106		Intercept	3.82260				38,066
x_{53} - Suburban	5		0.04202	-0.06860	-0.06871	0.26686	-0.22687	31,667
x_{54} - Rural	8		0.06723	-0.06866	-0.81740	0.06798	-2.22221	14,814
			Analysis of Variance					
"F" Value		1.84288			2.89884			
R^2 ($\bar{R}^2$)		.07686 (.01550)			.28757 (.21036)			
Std. Error of Estimate . . .		0.72808			0.68868			

SANTA CATARINA - AGE/INCOME PROFILES - 1960

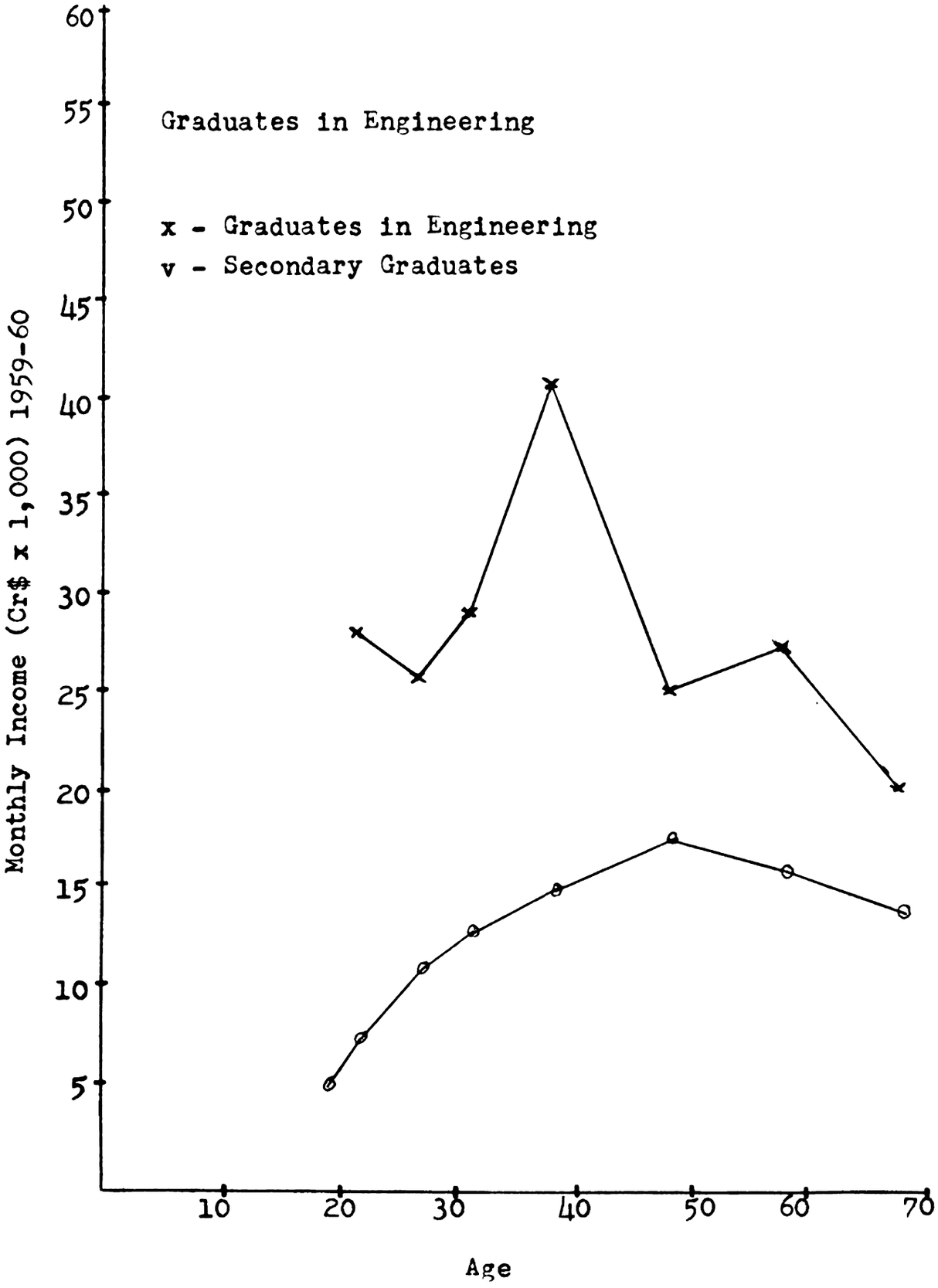


Fig. 62

TABLE 85

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF GRADUATES OF LAW

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years or University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	0												
x_5 - 5 years	220												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	6	0.02800	-0.15366	-0.65109	0.26486	-2.28808	14,586	0.02800	-0.15356	-0.53250	0.30960	-1.71883	7,800
x_9 - 27 " "	46	0.19565	-0.14236	-0.19976	0.18736	-1.06672	22,817	0.19565	-0.14236	-0.04662	0.14073	-0.46762	11,449
x_{10} - 32 " "	83	0.27301	0.01964	0.02200	0.11583	0.19818	28,507	0.27301	0.01964	0.07848	0.11476	0.61402	13,158
x_{11} - 39 " "	72	Intercept		8.287727			27,082	Intercept		8.20655			19,963
x_{12} - 49 " "	25	0.12817	0.18998	0.31068	0.13800	2.25000	26,011	0.12817	0.18998	0.29994	0.13703	2.18898	16,552
x_{13} - 59 " "	6	0.02800	-0.07968	-0.33478	0.18456	-1.18261	19,954	0.02800	-0.07952	-0.24536	0.29297	-0.77085	9,758
x_{14} - 68 " "	3	0.01304	0.18341	0.98796	0.39468	2.36184	70,472	0.01304	0.18341	1.04968	0.38708	2.71184	36,087
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	220												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	18							Intercept		8.20655			19,963
x_{26} - Male	218							0.08478	0.04549	0.08868	0.09988	0.88981	20,040

Head of Family							
x_{27} - Not Head	36		0.15652	-0.19700	0.25746	0.27666	1.24441	15,549
x_{28} - Head	194		Intercept	2.00625				12,965
Religion								
x_{29} - Protestant	18		0.00217	-0.10764	-0.00000	0.00010	-1.00010	4,897
x_{30} - Jewish	0							
x_{31} - Other	10		0.00241	-0.04157	-0.10000	0.10025	-1.00253	10,549
x_{32} - Roman Catholic	190		Intercept	2.00656				12,965
Race								
x_{33} - Black	0							
x_{34} - White	200							
x_{35} - Other	0							
Children								
x_{36} - Has Children	178		0.77301	0.15200	0.17128	0.15000	1.32007	14,965
x_{37} - No Children	22		Intercept	2.00625				12,965
Class of Activity								
x_{38} - Agriculture	0							
x_{39} - Extractive	1		0.00435	0.00102	0.36420	0.00417	0.53606	17,972
x_{40} - Mfg. Industry	5		0.00174	0.01141	0.11575	0.13602	0.25006	15,749
x_{41} - Commerce and Transportation	10		0.07826	0.04542	0.00055	0.00010	0.42006	13,494
x_{42} - Service Industries	2		0.00870	-0.15434	-0.44712	0.00053	-1.15048	9,459
x_{43} - Government or Other	85		Intercept	2.00625				12,965
x_{44} - Liberal Professions	92		0.40000	-0.13700	0.00206	0.13026	0.10006	13,582
x_{45} - Social Services	20		0.13909	-0.06057	-0.08741	0.14778	-1.04189	9,199
Position								
x_{46} - Public Employee	111		Intercept	2.00625				12,965
x_{47} - Employer or Own Account	97		0.42174	-0.17068	-0.24649	0.25006	-1.00213	8,672
x_{48} - Private Employee	92		0.09565	0.03418	-0.10222	0.19654	-0.00381	11,672
Migration								
x_{49} - No Migration	186		0.46087	-0.01722	0.03644	0.00200	0.40003	12,745
x_{50} - From Rural	18		0.05217	-0.01202	0.10066	0.00001	0.51010	13,632
x_{51} - From Urban	111		Intercept	2.00625				12,965
Environment								
x_{52} - Urban	118		Intercept	2.00625				12,965
x_{53} - Suburban	8		0.03478	-0.03006	-0.15035	0.12000	-0.00200	10,406
x_{54} - Rural	4		0.01730	-0.00700	-0.13301	0.34206	-0.20001	10,750
Analysis of Variance								
"F" Value		4.00000				2.81000		
R^2 ($\bar{R}^2$)		.00010 (.07909)				.00004 (.15795)		
Std. Error of Estimate		0.00000				0.00000		

SANTA CATARINA - AGE/INCOME PROFILES - 1960

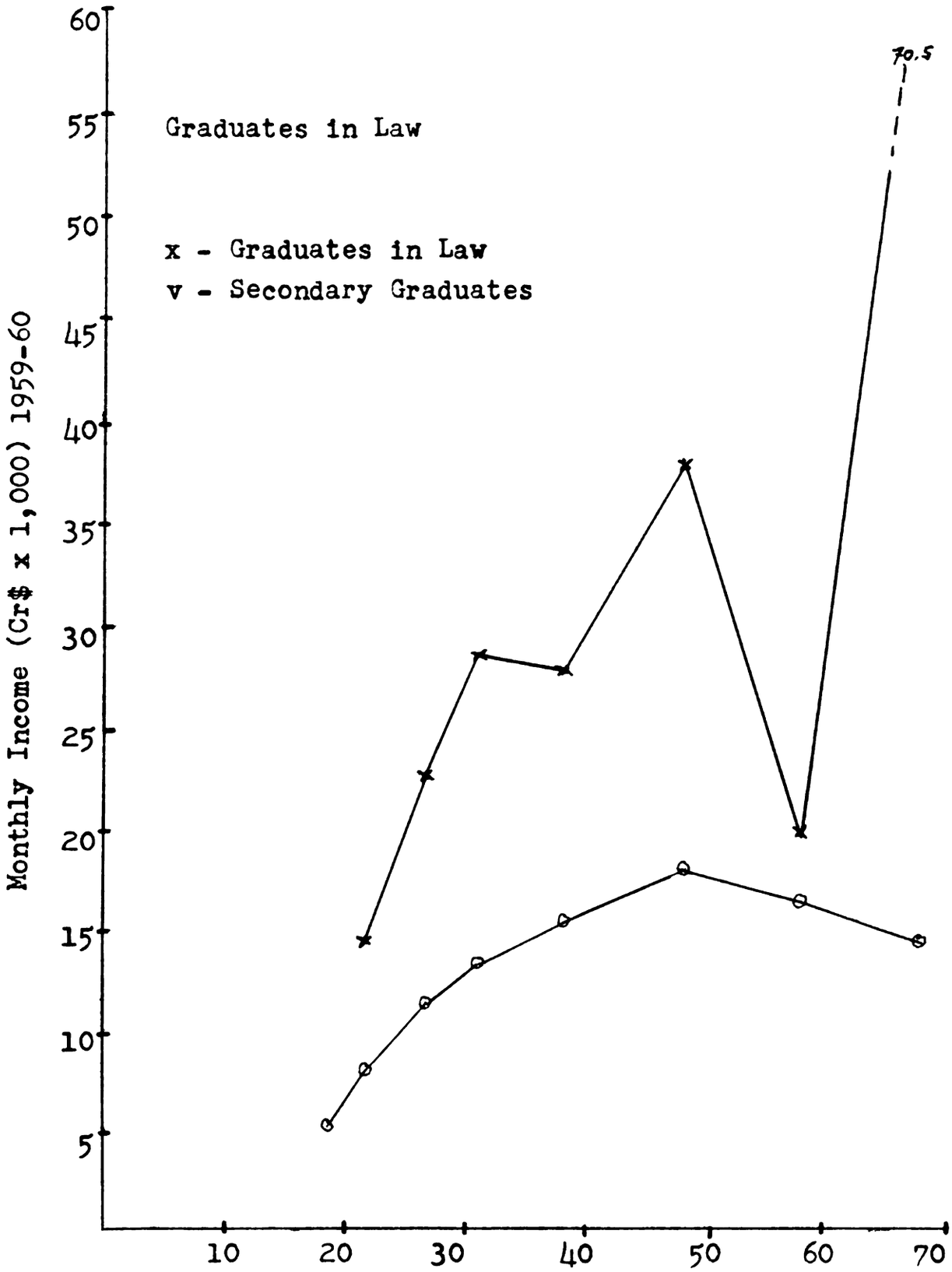


Fig. 63

TABLE 86

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF GRADUATES IN AGRONOMY

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Regression nº Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	41												
x_5 - 5 years	0												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	1	0.02439	0.02068	1.18855	1.43709	0.82706	23,309						
x_9 - 27 " "	7	0.17073	0.22133	1.67272	0.60509	2.76440	37,847						
x_{10} - 32 " "	13	0.31707	0.31897	1.64141	0.48622	3.42443	37,409						
x_{11} - 39 " "	20	Intercept	1.99030				7,321						
x_{12} - 49 " "	2	0.04878	0.10376	1.61280	1.03638	1.55681	35,606						
x_{13} - 59 " "	6	0.14634	0.18118	1.67009	0.64891	2.58300	30,916						
x_{14} - 68 " "	0												
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	41												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	1												
x_{26} - Male	40												

Head of Family			
x_{27} - Not Head	4		
x_{28} - Head	37		
Religion			
x_{29} - Protestant	6		
x_{30} - Jewish	0		
x_{31} - Other	3		
x_{32} - Roman Catholic	32		
Race			
x_{33} - Black	0		
x_{34} - White	41		
x_{35} - Other	0		
Children			
x_{36} - Has Children	31		
x_{37} - No Children	10		
Class of Activity			
x_{38} - Agriculture	6		
x_{39} - Extractive	0		
x_{40} - Mfg. Industry	3		
x_{41} - Commerce and Transportation	6		
x_{42} - Service Industries	0		
x_{43} - Government or Other	18		
x_{44} - Liberal Professions	6		
x_{45} - Social Services	2		
Position			
x_{46} - Public Employee	26		
x_{47} - Employer or Own Account	5		
x_{48} - Private Employee	11		
Migration			
x_{49} - No Migration	10		
x_{50} - From Rural	2		
x_{51} - From Urban	29		
Environment			
x_{52} - Urban	29		
x_{53} - Suburban	1		
x_{54} - Rural	8		
Analysis of Variance			
"F" Value		3.44187	
R^2 (R^2)		.39068 (.25509)	
Std. Error of Estimate		1.40798	

SANTA CATARINA - AGE/INCOME PROFILES - 1960

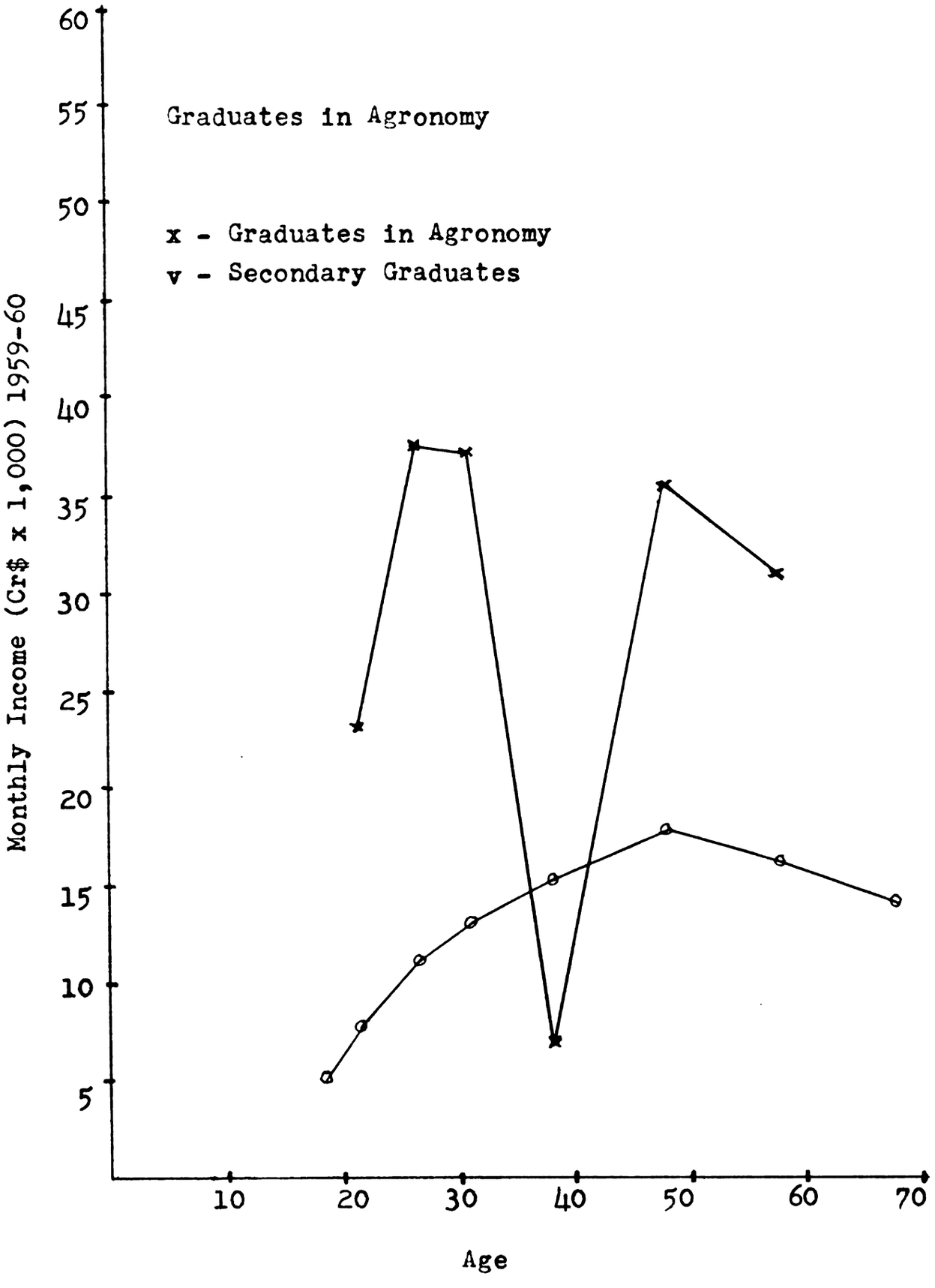


Fig. 64

TABLE 87

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES OF ECONOMY

Variable Number and Description	Sample Size	Regression nº 1 Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Regression nº Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	0												
x_4 - 4 years	76												
x_5 - 5 years	0												
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	0												
x_8 - 22 " "	2	0.03634	0.03446	-0.06315	0.47560	-0.13278	22,913						
x_9 - 27 " "	18	0.23684	-0.17709	-0.41380	0.20308	-2.03871	18,134						
x_{10} - 32 " "	26	0.32895	-0.11179	-0.20734	0.18640	-1.65210	17,936						
x_{11} - 39 " "	22	Intercept		3.19485			24,406						
x_{12} - 49 " "	8	0.06579	0.24168	0.60100	0.21833	1.28970	26,447						
x_{13} - 59 " "	2	0.03428	-0.14858	-0.80140	0.47560	-1.68441	10,954						
x_{14} - 68 " "	1	0.01316	-0.04968	-0.48680	0.66901	-0.72698	15,000						
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	76												
x_{24} - All other courses completed except Seminary	0												
Sex													
x_{25} - Female	3												
x_{26} - Male	73												

Head of Family			
x_{27} - Not Head	7		
x_{28} - Head	69		
Religion			
x_{29} - Protestant	18		
x_{30} - Jewish	0		
x_{31} - Other	7		
x_{32} - Roman Catholic	54		
Race			
x_{33} - Black	0		
x_{34} - White	76		
x_{35} - Other	0		
Children			
x_{36} - Has Children	61		
x_{37} - No Children	15		
Class of Activity			
x_{38} - Agriculture	0		
x_{39} - Extractive	0		
x_{40} - Mfg. Industry	13		
x_{41} - Commerce and Transportation	24		
x_{42} - Service Industries	2		
x_{43} - Government or Other	15		
x_{44} - Liberal Professions	10		
x_{45} - Social Services	7		
Position			
x_{46} - Public Employee	21		
x_{47} - Employer or Own Account . .	27		
x_{48} - Private Employee	28		
Migration			
x_{49} - No Migration	38		
x_{50} - From Rural	8		
x_{51} - From Urban	32		
Environment			
x_{52} - Urban	68		
x_{53} - Suburban	0		
x_{54} - Rural	2		
Analysis of Variance			
"F" Value		1.87888	
R^2 (R_2)		.14081 (.07881)	
Std. Error of Estimate . . .		0.44813	

SANTA CATARINA - AGE/INCOME PROFILES - 1960

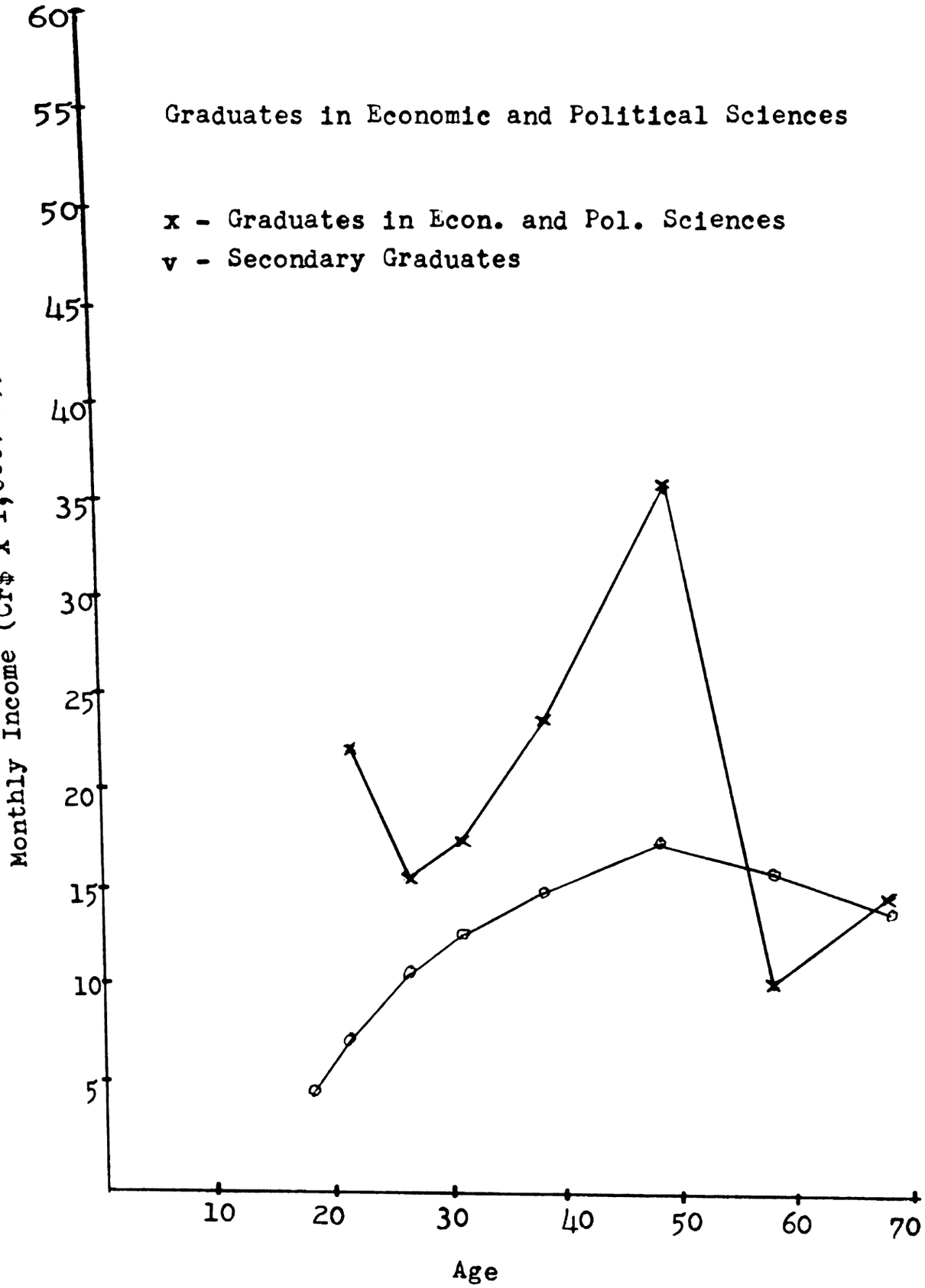


Fig. 65

Other Courses Completed.--In this group, Females show gnificantly lower incomes than Males; and within Class of ctivity, Service Industries, Liberal Professions, and Social ervices have smaller incomes than do the other groups. The egressions for the sub-sample are contained in Table 88 and the age-income profile in Figure 66.

Studies by Years of University Completed.--This study was not performed for Santa Catarina. The general effect of the Years Completed variables can be obtained from the re- gressions on the professional sub-samples.

TABLE 88

STATE OF SANTA CATARINA
REGRESSIONS OF LOG INCOME FROM SAMPLE OF
GRADUATES IN "OTHER COURSES"

Variable Number and Description	Sample Size	Regression nº 1						Regression nº 2					
		Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.	Mean	Corr. Coef.	Regr. Coef.	Std. Error	"T" Value	Antilog. Log.Inc.
Years of University Completed													
x_1 - 1 year	0												
x_2 - 2 years	0												
x_3 - 3 years	72							Intercept	3.16624				23,718
x_4 - 4 years	38							0.28571	-0.23666	0.00349	0.18499	0.01887	23,804
x_5 - 5 years	16							0.12080	-0.01843	0.10439	0.18043	0.46493	26,478
x_6 - 6 years	0												
Age													
x_7 - 19 years midpoint	1	0.00752	-0.16680	-1.38285	0.78339	-1.76588	8,250	0.00752	-0.16650	-1.14063	0.76729	-1.48657	7,581
x_8 - 22 " "	14	0.10286	-0.10066	-0.14673	0.46719	-0.31470	18,481	0.10286	-0.10066	0.17486	0.45004	0.69934	26,250
x_9 - 27 " "	22	0.17293	0.01472	0.12536	0.21068	0.59518	23,804	0.17293	0.01472	0.28436	0.19365	1.46664	31,487
x_{10} - 32 " "	23	0.24612	0.11281	0.26126	0.19139	1.36499	27,141	0.24612	0.11281	0.34910	0.16795	2.07859	33,627
x_{11} - 39 " "	22	Intercept	3.04348				20,978	Intercept	3.16624				23,718
x_{12} - 49 " "	20	0.15038	0.11304	0.31015	0.21969	1.41046	26,606	0.15038	0.11304	0.33157	0.20672	1.58868	33,043
x_{13} - 59 " "	7	0.05263	-0.10749	-0.28454	0.34189	-0.79078	16,144	0.05263	-0.10794	-0.31264	0.28509	-1.09643	17,360
x_{14} - 68 " "	3	0.02256	0.02304	0.22943	0.46579	0.49267	26,388	0.02256	0.02304	0.20187	0.43904	0.70196	22,076
Course Completed													
x_{15} - Secondary	0												
x_{16} - Philosophy	0												
x_{17} - Medicine	0												
x_{18} - Pharmacy	0												
x_{19} - Dentistry	0												
x_{20} - Engineering	0												
x_{21} - Law	0												
x_{22} - Agronomy	0												
x_{23} - Econ./Pol. Science	0												
x_{24} - All other courses completed except Primary	188												
Sex													
x_{25} - Female	8							0.03015	-0.44078	-1.03886	0.80688	-0.91018	8,998
x_{26} - Male	188							Intercept	3.16624				23,718

Head of Family								
x_{27} - Not Head	21		0.15789	-0.06182	-0.09428	0.00008	-1.86289	17,114
x_{28} - Head	119		Intercept	3.16894				23,718
Religion								
x_{29} - Protestant	18		0.11878	-0.09660	-0.08303	0.19888	-1.81248	18,416
x_{30} - Jewish	0							
x_{31} - Other	16		0.18430	0.06934	0.07812	0.17969	0.45473	20,645
x_{32} - Roman Catholic	102		Intercept	3.16894				23,718
Race								
x_{33} - Black	0							
x_{34} - White	138							
x_{35} - Other	0							
Children								
x_{36} - Has Children	98		0.69173	0.15778	0.04773	0.15808	0.81388	24,877
x_{37} - No Children	41		Intercept	3.16894				23,718
Class of Activity								
x_{38} - Agriculture	5		0.02856	-0.03017	-0.88672	0.47404	+1.11115	14,000
x_{39} - Extractive	1		0.00788	0.16366	0.91788	0.78388	1.81800	30,978
x_{40} - Mfg. Industry	22		0.16841	0.00141	-0.85698	0.20881	-0.82888	18,207
x_{41} - Commerce and Transportation	4		0.03008	-0.08844	-0.89471	0.47840	-0.61898	17,604
x_{42} - Service Industries	1		0.00788	-0.19979	-1.84388	0.78388	-0.44888	3,788
x_{43} - Government or Other	78		Intercept	3.16894				23,718
x_{44} - Liberal Professions	12		0.09083	-0.88040	-0.80938	0.88098	-0.18881	9,888
x_{45} - Social Services	12		0.09083	-0.81089	-0.85944	0.87884	-0.88188	12,888
Position								
x_{46} - Public Employee	80		Intercept	3.16894				23,718
x_{47} - Employer or Own Account	9		0.06787	-0.09697	0.34288	0.20884	1.11181	28,408
x_{48} - Private Employee	36		0.86316	-0.15691	0.18838	0.88019	0.71611	18,878
Migration								
x_{49} - No Migration	30		0.[illegible]	-0.09188	0.06726	0.14348	0.48988	26,871
x_{50} - From Rural	8		Intercept	3.16894				23,718
x_{51} - From Urban	88		Intercept	3.16894				23,718
Environment								
x_{52} - Urban	96							
x_{53} - Suburban	7							
x_{54} - Rural	30							
Analysis of Variance								
"F" Value		4.[illegible]			4.01088			
R^2 (R^2)		.47888 (.02926)			.47126 (.35968)			
Std. Error of Estimate		0.77148			0.68708			

SANTA CATARINA - AGE/INCOME PROFILES - 1960

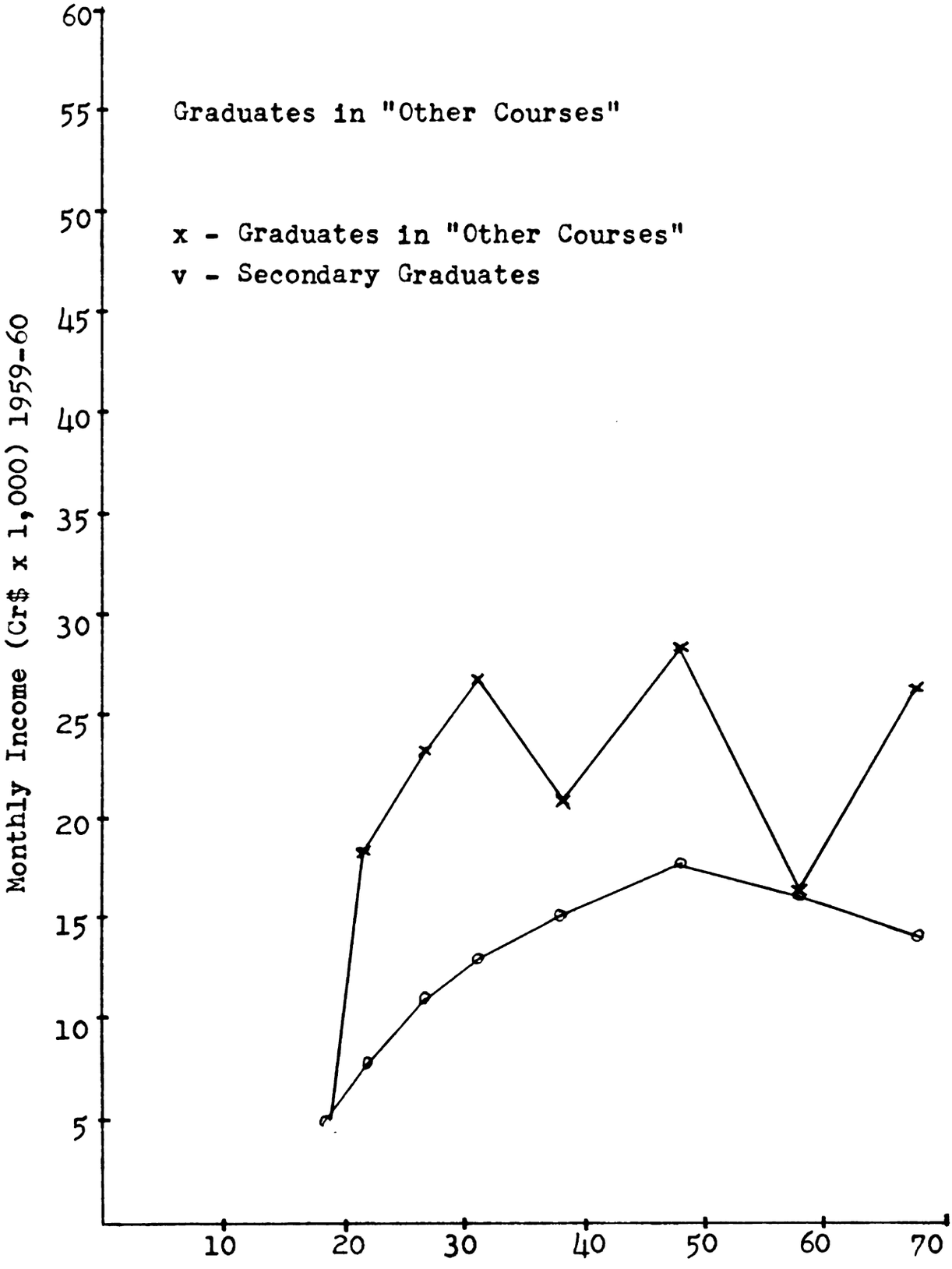


Fig. 66

APPENDIX II

RATE OF RETURN CALCULATIONS

TABLE 89

PRIVATE RATE OF RETURN CALCULATIONS
ESPIRITO SANTO, ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir. Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	---	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.00)	46
25	---	---	---	8,910	6,960	200	.99919	18	-(38.70)	44
28	18,190	.0273	17,712	8,910	---	---	.99919	42	369.37	41
32	21,440	.0644	20,060	11,440	---	---	.99838	60	516.32	37
39	31,020	.0644	29,020	16,440	---	---	.99643	120	1,504.49	30
49	31,620	.0644	29,580	18,860	---	---	.99085	120	1,275.06	20
59	27,640	.0644	25,860	16,780	---	---	.97773	120	1,065.33	10
68	23,670	.0644	22,150	19,030	---	---	.94954	72	213.01	1

Private Rate of Return: 24.9454

TABLE 90

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, PHILOSOPHY GRADUATES

Age Midpt	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir. Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	.-----	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.05)	46
25	---	---	---	8,910	6,960	200	.99919	6	-(12.86)	44
27	17,018	.0273	16,553	8,910	---	---	.99919	54	412.39	42
32	16,353	.0273	15,907	11,440	---	---	.99838	60	267.59	37
39	17,301	.0273	16,829	16,440	---	---	.99643	120	46.51	30
49	26,071	.0644	24,392	18,860	---	---	.99085	120	657.77	20
59	15,000	.0273	14,591	16,780	---	---	.97773	120	-(256.83)	10
*68	15,000	.0273	14,591	19,030	---	---	.94954	72	-(303.48)	1

* Estimated

Private Rate of Return: 23.9020

TABLE 91

PRIVATE RATE OF RETURN CALCULATIONS
ESPIRITO SANTO, MEDICINE GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.00)	46
26	---	---	---	8,910	6,960	200	.99919	36	-(77.34)	43
29	25,490	.0644	23,830	8,910	---	---	.99919	24	357.78	40
32	23,870	.0644	22,330	11,440	---	---	.99838	60	652.51	37
39	40,160	.0644	37,570	16,440	---	---	.99643	120	2,526.70	30
49	37,550	.0644	35,130	18,860	---	---	.99085	120	1,934.75	20
59	34,210	.0644	32,010	16,780	---	---	.97773	120	1,786.53	10
68	15,000	.0273	14,590	19,030	---	---	.94954	72	-(303.51)	1

Private Rate of Return: 25.2645

TABLE 92

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, PHARMACY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Unv. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	.-----	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.00)	46
25	---	---	---	8,910	6,960	200	.99919	6	-(12.89)	44
28	16,730	.0273	16,270	8,910	---	---	.99919	54	397.29	41
32	15,670	.0273	15,240	11,440	---	---	.99838	60	227.76	37
39	15,000	.0273	14,590	16,440	---	---	.99643	120	-(221.15)	30
49	16,130	.0273	15,690	18,860	---	---	.99085	120	-(376.96)	20
59	17,190	.0273	16,720	16,780	---	---	.97773	120	-(6.96)	10
68	12,820	.0273	12,470	19,030	---	---	.94954	72	-(448.49)	1

Private Rate of Return: <0

TABLE 93

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, DENTISTRY GRADUATES

Age Midpt	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.00)	46
25	---	---	---	8,910	6,960	200	.99919	6	-(12.89)	44
28	13,390	.0273	13,020	8,910	---	---	.99919	54	222.00	41
32	16,180	.0273	15,740	11,440	---	---	.99838	60	257.48	37
39	22,910	.0644	21,430	16,440	---	---	.99643	120	597.21	30
49	24,910	.0644	23,310	18,860	---	---	.99085	120	528.61	20
59	15,840	.0273	15,410	16,780	---	---	.97773	120	-(161.02)	10
68	26,390	.0644	24,690	19,030	---	---	.94954	72	386.99	1

Private Rate of Return: 18.2683

TABLE 94

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, ENGINEERING GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud Inc./Mo.	Dir.Univ. Costs/Mo	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.00)	46
26	---	---	---	8,910	6,960	200	.99919	24	-(51.56)	43
28	27,230	.0644	25,480	8,910	---	---	.99919	36	595.91	40
32	24,780	.0644	23,180	11,440	---	---	.99838	60	703.51	37
39	33,820	.0644	31,640	16,440	---	---	.99643	120	1,817.73	30
49	32,760	.0644	30,650	18,860	---	---	.99085	120	1,401.89	20
59	32,930	.0644	30,810	16,780	---	---	.97773	120	1,646.03	10
68	15,000	.0273	14,590	19,030	---	---	.94954	72	-(303.51)	1

Private Rate of Return: 28.0648

TABLE 95

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, LAW GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow/Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.00)	46
26	---	---	---	8,910	6,960	200	.99919	24	-(51.56)	43
28	17,550	.0273	17,070	8,910	---	---	.99919	36	293.55	41
32	23,390	.0644	21,880	11,440	---	---	.99838	60	625.61	37
39	33,470	.0644	31,310	16,440	---	---	.99643	120	1,778.57	30
49	35,230	.0644	32,960	18,860	---	---	.99085	120	1,676.66	20
59	44,510	.0644	41,640	16,780	---	---	.97773	120	2,917.18	10
68	58,730	.1898	47,580	19,030	---	---	.94954	72	1,952.08	1

Private Rate of Return: 24.8776

TABLE 96

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, AGRONOMY GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.05)	46
25	---	---	---	8,910	6,960	200	.99919	12	-(25.72)	44
28	29,544	.0644	27,641	8,910	---	---	.99919	48	898.36	41
32	28,346	.0644	26,521	11,440	---	---	.99838	60	903.39	37
39	36,781	.0644	34,412	16,440	---	---	.99643	120	2,148.94	30
49	22,913	.0644	21,437	18,860	---	---	.99085	120	306.41	20
59	15,000	.0273	14,591	16,780	---	---	.97773	120	-(256.83)	10
*68	15,000	.0273	14,591	19,030	---	---	.94954	72	-(303.48)	1

* Estimated

Private Rate of Return: 35.8580

TABLE 97

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, ECON/POLITICAL SCIENCES GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud Inc./Mo.	Dir.Univ Costs/Mo	Mortality	Mos. in Period	Flow Per Period Cr$1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	182	.99971	36	-(72.05)	46
25	---	---	---	8,910	6,960	195	.99919	12	-(25.72)	44
28	38,653	.0644	36,164	8,910	---	---	.99919	48	1,307.13	41
32	62,048	.0644	58,052	11,440	---	---	.99838	60	2,792.19	37
39	35,000	.0644	32,746	16,440	---	---	.99643	120	1,949.73	30
49	35,000	.0644	32,746	18,860	---	---	.99085	120	1,651.07	20
59	20,125	.0644	18,829	16,780	---	---	.97773	120	240.40	10
*68	5,250	---	5,250	19,030	---	---	.94954	72	-(942.10)	1

* Interpolated

Private Rate of Return: 45.0697

TABLE 98

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, OTHER COURSES COMPLETED GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	180	.99971	36	-(72.05)	46
25	---	---	---	8,910	6,960	200	.99919	6	-(12.86)	44
28	14,313	.0273	13,922	8,910	---	---	.99919	54	270.43	41
32	16,886	.0273	16,425	11,440	---	---	.99838	60	298.62	37
39	23,334	.0644	21,831	16,440	---	---	.99643	120	644.61	30
49	31,937	,0644	29,880	18,860	---	---	.99085	120	1,310.30	20
59	26,139	.0644	24,456	16,780	---	---	.97773	120	900.61	10
68	20,340	.0644	19,030	19,030	---	---	.94954	72	---	1

Private Rate of Return: 20.4375

TABLE 99

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, ONE YEAR UNIVERSITY COMPLETED GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$xl,000	Yrs. to End
19	---	---	---	5,750	4,560	---	-------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
22	---	---	---	7,030	5,210	182	.99971	12	-(24.02)	47
24	8,656	.0164	8,514	8,910	---	---	.99919	24	-(9.50)	45
27	11,077	.0273	10,786	8,910	---	---	.99919	60	112.47	42
32	17,275	.0273	16,803	11,440	---	---	.99838	60	321.26	37
39	8,000	.0164	7,869	16,440	---	---	.99643	120	-(1,024.85)	30
*49	6,625	.0164	6,516	18,860	---	---	.99085	120	-(1,467.73)	20
59	5,250	---	5,250	16,780	---	---	.97773	120	-(1,352.79(	10
*68	5,250	---	5,250	19,030	---	---	.94954	72	-(942.10)	1

* Interpolations

Private Rate of Return: < 0

TABLE 100

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, TWO YEARS UNIVERSITY COMPLETED GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	182	.99971	24	-(48.04)	46
24	5,332	---	5,332	8,910	---	---	.99919	12	-(42.90)	45
27	12,697	.0273	12,350	8,910	---	---	.99919	60	206.23	42
32	15,476	.0273	15,054	11,440	---	---	.99838	60	216.49	37
39	26,469	.0644	24,764	16,440	---	---	.99643	120	995.31	30
49	24,426	.0644	22,853	18,860	---	---	.99085	120	474.78	20
59	22,383	.0644	20,942	16,780	---	---	.97773	120	488.32	10
*68	20,340	.0644	19,030	19,030	---	---	.94954	72	---	1

* Interpolations

Private Rate of Return: 19.5203

TABLE 101

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, THREE YEARS UNIVERSITY COMPLETED GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	182	.99971	36	-(72.05)	46
26	12,968	.0273	12,627	8,910	---	---	.99919	24	89.14	43
28	12,968	.0273	12,627	8,910	---	---	.99919	36	133.70	41
32	16,789	.0273	16,347	11,440	---	---	.99838	60	293.94	37
39	22,335	.0644	20,897	16,440	---	---	.99643	120	532.93	30
49	23,771	.0644	22,240	18,860	---	---	.99085	120	401.89	20
59	14,552	.0273	14,169	16,780	---	---	.97773	120	-(308.02)	10
68	15,670	.0273	15,258	19,030	---	---	.94954	72	-(257.88)	1

Private Rate of Return: 19.8170

TABLE 102

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, FOUR YEARS UNIVERSITY COMPLETED GRADUATES

Age Midpt	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	182	.99971	36	-(72.05)	46
25	---	---	---	8,910	6,960	195	.99919	12	-(25.72)	44
28	17,928	.0273	17,439	8,910	---	---	.99919	48	409.06	41
32	18,829	.0273	18,315	11,440	---	---	.99838	60	411.83	37
39	25,353	.0644	23,720	16,440	---	---	.99643	120	870.48	30
49	25,990	.0644	24,316	18,860	---	---	.99085	120	648.73	20
59	19,895	.0273	19,352	16,780	---	---	.97773	120	301.77	10
68	17,623	.0273	17,142	19,030	---	---	.94954	72	-(129.08)	1

Private Rate of Return: 24.1727

TABLE 103

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, FIVE YEARS UNIVERSITY COMPLETED GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	182	.99971	36	-(72.05)	46
26	---	---	---	8,910	6,960	195	.99919	24	-(51.44)	43
28	19,621	.0273	19,085	8,910	---	---	.99919	36	366.00	41
32	23,634	.0644	22,112	11,440	---	---	.99838	60	639.28	37
39	33,228	.0644	31,088	16,440	---	---	.99643	120	1,751.48	30
49	34,441	.0644	32,223	18,860	---	---	.99085	120	1,588.89	20
59	37,147	.0644	34,755	16,780	---	---	.97773	120	2,108.96	10
68	46,779	.0644	43,766	19,030	---	---	.94954	72	1,691.12	1

Private Rate of Return: 26.0427

TABLE 104

PRIVATE RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, SIX YEARS UNIVERSITY COMPLETED GRADUATES

Age Midtp	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net.Stud. Inc./Mo.	Dir.Unv. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,750	4,560	---	------	24	-(28.56)	50
21	---	---	---	7,030	5,130	---	.99971	24	-(45.60)	48
23	---	---	---	7,030	5,210	182	.99971	36	-(72.05)	46
26	---	---	---	8,910	6,960	195	.99919	36	-(77.16)	43
29	25,472	.0644	23,832	8,910	---	---	.99919	24	357.84	40
32	23,868	.0644	22,331	11,440	---	---	.99838	60	652.40	37
39	40,155	.0644	37,569	16,440	---	---	.99643	120	2,526.43	30
49	37,554	.0644	35,136	18,860	---	---	.99085	120	1,935.25	20
59	34,208	.0644	32,005	16,780	---	---	.97773	120	1,786.31	10
68	15,000	.0273	14,591	19,030	---	---	.94954	72	-(303.48)	1

Private Rate of Return: 25.2718

TABLE 105

SOCIAL RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs. to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	7,590 20,940	5,210	.99971	36	-(342.98)	46	-(823.68)
25	---	9,060	7,590 20,940	7,080	.99919	18	-(172.12)	44	-(412.23)
28	18,190	9,060	---	---	.99919	42	383.15	41	383.15
32	21,440	11,760	---	---	.99838	60	579.86	37	579.86
39	31,020	16,900	---	---	.99643	120	1,688.35	30	1,688.35
49	31,620	20,160	---	---	.99085	120	1,362.62	20	1,362.62
59	27,640	17,250	---	---	.97773	120	1,219.03	10	1,219.03
68	23,670	20,340	---	---	.94954	72	227.66	1	227.66

Social Rates of Return: 14.8784 8.2231

TABLE 106

SOCIAL RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, PHILOSOPHY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	3,458 11,730	5,210	.99971	36	-(194.13)	46	-(491.63)
25	---	9,060	3,458 11,730	7,080	.99919	6	-(32.60)	44	-(82.18)
27	17,018	9,060	---	---	.99919	54	429.30	42	429.30
32	16,353	11,760	---	---	.99838	60	275.03	37	275.03
39	17,301	16,900	---	---	.99643	120	47.93	30	47.93
49	26,071	20,160	---	---	.99085	120	702.23	20	702.23
59	15,000	17,250	---	---	.97773	120	-(263.79)	10	-(263.79)
*68	15,000	20,340	---	---	.94954	72	-(364.87)	1	-(364.87)

* Estimated

Social Rates of Return: 15.5822 5.1942

TABLE 107

SOCIAL RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, MEDICINE GRADUATES

Age Midpt	Gross Inc Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period w/O Capital Cost Cr$x1,000	Yrs. to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	15,970 45,050	5,210	.99971	36	-(644.57)	46	-(1,691.15)
26	---	9,060	15,970 45,050	7,080	.99919	36	-(645.68)	43	-(1,691.11)
29	25,470	9,060	---	---	.99919	24	393.52	40	393.52
32	23,870	11,760	---	---	.99838	60	725.42	37	725.42
39	40,160	16,900	---	---	.99643	120	2,781.24	30	2,781.24
49	37,550	20,160	---	---	.99085	120	2,067.71	20	2,067.71
59	34,210	17,250	---	---	.97773	120	1,989.88	10	1,989.88
68	15,000	20,340	---	---	.94954	72	-(365.68)	1	-(365.68)

Social Rates of Return: 10.8518 4.348

TABLE 108

SOCIAL RATE OF RETURN CALCULATIONS
ESPIRITO SANTO, PHARMACY GRADUATES

Age Midpt	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period w/O Capital Cost Cr$xl,000	Yrs.to End	Flow/ Period with Capital Costs Cr$xl,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	13,040 28,520	5,210	.99971	36	-(539.12)	46	-(1,096.24)
25	---	9,060	13,040 28,520	7,080	.99919	6	-(90.05)	43	-(182.85)
28	16,730	9,060	---	---	.99919	54	413.84	41	413.84
32	15,670	11,760	---	---	.99838	60	234.22	37	234.22
39	15,000	16,900	---	---	.99643	120	-(227.19)	30	-(227.19)
49	16,130	20,160	---	---	.99085	120	-(479.18)	20	-(479.18)
59	17,190	17,250	---	---	.97773	120	-(7.04)	10	-(7.04)
68	12,820	20,340	---	---	.94954	72	-(541.12)	1	-(541.12)

Social Rates of Return: <0 <0

TABLE 109

SOCIAL RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, DENTISTRY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	8,210 21,285	5,210	.99971	36	-(364.34)	46	-(835.86)
25	---	9,060	8,210 21,285	7,080	.99919	6	-(61.09)	44	-(139.48)
28	13,390	9,060	---	---	.99919	54	233.63	41	233.63
32	16,180	11,760	---	---	.99838	60	264.77	37	264.77
39	22,910	16,900	---	---	.99643	120	718.63	30	718.63
49	24,910	20,160	---	---	.99085	120	564.78	20	564.78
59	15,840	17,250	---	---	.97773	120	-(165.43)	10	-(165.43)
68	26,390	20,340	---	---	.94954	72	413.62	1	413.62

Social Rates of Return: 9.0379 3.6531

TABLE 110

SOCIAL RATE OF RETURN CALCULATIONS
ESPIRITO SANTO, ENGINEERING GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period w/O Capital Cost Cr$xl,000	Yrs. to End	Flow/ Period with Capital Costs Cr$xl,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	9,440 26,790	5,210	.99971	36	-(409.56)	46	-(1,033.98)
26	---	9,060	9,440 26,790	7,080	.99919	24	-(273.86)	43	-(689.92)
28	27,230	9,060	---	---	.99919	36	653.59	41	653.59
32	24,780	11,760	---	---	.99838	60	779.93	37	779.93
39	33,820	16,900	---	---	.99643	120	2,023.15	30	2,023.15
49	32,760	20,160	---	---	.99085	120	1,498.17	20	1,498.17
59	32,930	17,250	---	---	.97773	120	1,839.70	10	1,839.70
68	15,000	20,340	---	---	.94954	72	-(365.08)	1	-(365.08)

Social Rates of Return: 16.7014 8.2673

TABLE 111

SOCIAL RATE OF RETURN CALCULATIONS
ESPIRITO SANTO, LAW GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs. to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	1,920 5,385	5,210	.99971	36	-(138.92)	46	-(263.62)
26	---	9,060	1,920 5,385	7,080	.99919	24	-(93.52)	43	-(176.62)
28	17,550	9,060	---	---	.99919	36	305.39	41	305.39
32	23,390	11,760	---	---	.99838	60	696.67	37	696.67
39	33,470	16,900	---	---	.99643	120	1,981.30	30	1,981.30
49	35,230	20,160	---	---	.99085	120	1,791.85	20	1,791.85
59	44,510	17,250	---	---	.97773	120	3,198.35	10	3,198.35
68	58,730	20,340	---	---	.94954	72	2,624.60	1	2,624.60

Social Rates of Return: 21.9579 17.3836

TABLE 112

SOCIAL RATE OF RETURN CALCULATIONS
ESPÍRITO SANTO, AGRONOMY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	16,499 38,114	5,210	.99971	36	-(663.14)	46	-(1,440.50)
25	---	9,060	16,499 38,114	7,080	.99919	12	-(221.53)	44	-(480.65)
28	29,544	9,060	---	---	.99919	48	982.25	41	982.25
32	28,346	11,760	---	---	.99838	60	993.17	37	993.17
39	36,781	16,900	---	---	.99643	120	2,371.41	30	2,371.41
49	22,913	20,160	---	---	.99085	120	327.06	20	327.06
59	15,000	17,250	---	---	.97773	120	-(263.79)	10	-(263.79)
*68	15,000	20,340	---	---	.94954	72	-(364.87)	1	-(364.87)

* Estimated

Social Rates of Return: 16.1388 7.5748

TABLE 113

SOCIAL RATE OF RETURN CALCULATIONS
ESPIRITO SANTO, ECONOMIC/POLITICAL SCIENCES GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000)	Yrs. to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	5,267 9,403	5,210	.99971	36	-(259.19)	46	-(407.94)
25	---	9,060	5,267 9,403	7,080	.99919	12	-(86.88)	44	-(136.46)
28	38,653	9,060	---	---	.99919	48	1,419.04	41	1,419.04
32	62,048	11,760	---	---	.99838	60	3,011.25	37	3,011.25
39	35,000	16,900	---	---	.99643	120	2,164.25	30	2,164.25
49	35,000	20,160	---	---	.99085	120	1,764.51	20	1,764.51
*59	20,125	17,250	---	---	.97773	120	337.32	10	337.32
68	5,250	20,340	---	---	.94954	72	-(1,031.66)	1	-(1,031.66)

* Interpolated

Social Rates of Return: 36.5932 31.2200

TABLE 114

SOCIAL RATE OF RETURN CALCULATIONS
ESPIRITO SANTO, GRADUATES OF OTHER COURSES

Age Midpt	Gross Inc Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period w/O Capital Cost Cr$x1,000	Yrs. to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,750	---	4,560	------	24	-(28.56)	50	-(28.56)
21	---	7,150	---	5,130	.99971	24	-(48.48)	48	-(48.48)
23	---	7,150	7,594 20,937	5,210	.99971	36	-(343.12)	46	-(823.33)
25	---	9,060	7,594 20,937	7,080	.99919	6	-(57.40)	44	-(137.39)
28	14,313	9,060	---	---	.99919	54	283.43	41	283.43
32	16,886	11,760	---	---	.99838	60	307.06	37	307.06
39	23,334	16,900	---	---	.99643	120	769.32	30	769.32
49	31,937	20,160	---	---	.99085	120	1,400.31	20	1,400.31
59	26,139	17,250	---	---	.97773	120	1,042.93	10	1,042.93
68	20,340	20,340	---	---	.94954	72	---	1	---

Social Rates of Return: 11.891 6.5365

TABLE 115

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	---	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
25	---	---	---	10,454	6,177	428	.99919	18	-(84.62)	44
27	23,513	.0644	21,999	10,454	---	---	.99919	42	484.49	42
32	29,317	.0644	27,429	13,040	---	---	.99838	60	861.94	37
39	32,384	.0644	30,298	16,309	---	---	.99643	120	1,672.74	30
49	29,976	.0644	28,046	18,263	---	---	.99085	120	1,163.16	20
59	27,364	.0644	29,602	17,823	---	---	.97773	120	912.66	10
68	27,354	.0644	25,592	16,879	---	---	.94954	72	595.71	1

Private Rate of Return: (1) 20.7309

TABLE 116

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, PHILOSOPHY GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
25	---	---	---	10,454	6,177	428	.99919	6	-(28.21)	--
27	14,022	.0273	13,639	10,454	---	---	.99919	54	171.86	--
32	21,724	.0644	20,325	13,040	---	---	.99838	60	436.39	37
39	12,228	.0273	11,894	16,309	---	---	.99643	120	-(527.89)	30
49	29,544	.0644	27,641	18,263	---	---	.99085	120	1,115.11	20
59	8,239	.0164	8,104	17,823	---	---	.97773	120	-(1,140.32)	10
68	13,555	.0273	13,185	16,879	---	---	.94954	72	-(252.55)	1

Private Rate of Return: <0

TABLE 117

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, MEDICINE GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Unv. Costs/Mo.	Mortality	Mos.in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
27	---	---	---	10,454	6,177	428	.99919	36	-(169.24)	42
29	28,035	.0644	26,230	10,454	---	---	.99919	24	378.31	40
32	38,538	.0644	36,056	13,040	---	---	.99838	60	1,378.73	37
39	43,351	.0644	40,559	16,309	---	---	.99643	120	2,899.63	30
49	39,940	.0644	37,368	18,263	---	---	.99085	120	2,271.62	20
59	34,926	.0644	32,677	17,823	---	---	.97773	120	1,742.76	10
68	26,387	.0644	24,688	16,879	---	---	.94954	72	533.85	1

Private Rate of Return: (1) 21.4697

TABLE 118

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, PHARMACY GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Unv. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
25	---	---	---	10,454	6,177	428	.99919	6	-(28.21)	44
27	16,134	.0273	15,694	10,454	---	---	.99919	54	282.71	42
32	16,371	.0273	15,924	13,040	---	---	.99838	60	172.76	37
39	25,473	.0644	23,833	16,309	---	---	.99643	120	899.60	30
49	17,301	.0273	16,829	18,263	---	---	.99085	120	-(170.54)	20
59	21,342	.0644	19,968	17,823	---	---	.97773	120	251.62	10
68	8,000	.0164	7.869	16,879	---	---	.94954	72	-(616.00)	1

Private Rate of Return: (1) 11.6619

TABLE 119

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, DENTISTRY GRADUATES

Age Midpt	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
25	---	---	---	10,454	6,177	428	.99919	12	-(56.41)	44
27	13,520	.0273	13,151	10,454	---	---	.99919	48	129.35	42
32	28,056	.0644	26,249	13,040	---	---	.99838	60	791.27	37
39	22,664	.0644	21,204	16,309	---	---	.99643	120	585.36	30
49	21,529	.0644	20,143	18,263	---	---	.99085	120	223.48	20
59	19,714	.0273	19,176	17,823	---	---	.97773	120	158.72	10
68	21,181	.0644	19,817	16,879	---	---	.94954	72	200.86	1

Private Rate of Return: 13.4333

TABLE 120

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ENGINEERING GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir. Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
26	---	---	---	10,454	6,177	428	.99919	24	-(112.82)	43
28	28,770	.0644	26,917	10,454	---	---	.99919	36	592.20	41
32	40,260	.0644	37,667	13,040	---	---	.99838	60	1,475.24	37
39	39,991	.0644	37,416	16,309	---	---	.99643	120	2,523.75	30
49	39,248	.0644	36,720	18,263	---	---	.99085	120	2,194.63	20
59	45,881	.0644	42,926	17,823	---	---	.97773	120	2,945.31	10
68	34,245	.0644	32,040	16,879	---	---	.94954	72	1,036.48	1

Private Rate of Return: (1) 24.1187

TABLE 121

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, LAW GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Unv. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
26	---	---	---	10,454	6,177	428	.99919	24	-(112.82)	43
28	22,450	.0644	21,004	10,454	---	---	.99919	36	379.50	41
32	24,428	.0644	22,855	13,040	---	---	.99838	60	587.94	37
39	35,777	.0644	33,473	16,309	---	---	.99643	120	2,052.32	30
49	36,549	.0644	34,195	18,263	---	---	.99085	120	1,894.38	20
59	29,813	.0644	27,893	17,823	---	---	.97773	120	1,181.49	10
68	52,220	.1898	42,309	16,879	---	---	.94954	72	1,738.55	1

Private Rate of Return: (1) 18.0259

TABLE 122

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, AGRONOMY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	----	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
27	---	---	---	10,454	6,177	428	.99919	12	-(56.41)	44
29	13,743	.0273	13,368	10,454	---	---	.99919	48	139.75	42
32	17,056	.0273	16,590	13,040	---	---	.99838	60	212.68	37
39	29,313	.0644	27,425	16,309	---	---	.99643	120	1,329.19	30
49	20,830	.0644	19,489	18,263	---	---	.99085	120	145.72	20
59	25,173	.0644	23,552	17,823	---	---	.97773	120	672.15	10
68	20,937	.0644	19,589	16,879	---	---	.94954	72	185.25	1

Private Rate of Return: (1) 11.7615

TABLE 123

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, ECON/POLITICAL SCIENCES GRADUATES

Age Midpt	Gross Inc Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
29	---	---	---	10,454	6,177	428	.99919	12	-(56.41)	44
29	16,733	.0273	16,276	10,454	---	---	.99919	48	279.24	42
32	24,342	.0644	22,774	13,040	---	---	.99838	60	583.12	37
39	29,544	.0644	27,641	16,309	---	---	.99643	120	1,355.03	30
49	26,388	.0644	24,689	18,263	---	---	.99085	120	764.02	20
59	22,913	.0644	21,437	17,823	---	---	.97773	120	424.07	10
68	35,000	.0644	32,746	16,879	---	---	.94954	72	1,084.78	1

Private Rate of Return: (1) 16.4478

TABLE 124

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, OTHER COURSES GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
25	---	---	---	10,454	6,177	428	.99919	12	-(56.41)	44
27	32,900	.0644	30,781	10,454	---	---	.99919	48	974.92	42
32	33,031	.0644	30,904	13,040	---	---	.99838	60	1,070.09	37
39	33,569	.0644	31,407	16,309	---	---	.99643	120	1,805.31	30
49	28,312	.0644	26,489	18,263	---	---	.99085	120	978.05	20
59	28,772	.0644	26,919	17,823	---	---	.97773	120	1,067.22	10
68	18,564	.0273	18,057	16,879	---	---	.94954	72	80.55	1

Private Rate of Return: 28.4188

TABLE 125

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, 1 YR UNIVERSITY GRADUATES

Age Midpt	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to Lnd
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
22	---	---	---	7,884	3,920	396	.99971	12	-(52.30)	47
24	8,116	.0164	7,983	10,454	---	428	.99919	24	2.37	45
27	12,655	.0273	12,310	10,454	---	---	.99919	60	111.24	42
32	16,969	.0273	16,506	13,040	---	---	.99838	60	207.61	37
39	22,913	.0644	21,437	16,309	---	---	.99643	120	613.16	30
49	22,200	.0644	20,770	18,263	---	---	.99085	120	298.13	20
59	35,000	.0644	32,746	17,823	---	---	.97773	120	1,750.88	10
68	35,000	.0644	32,746	16,879	---	---	.94954	72	1,084.78	1

Private Rate of Return: 12.6692

TABLE 126

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, 2 YRS UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs.to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	24	-(104.61)	46
24	7,720	.0164	7,593	7,884	---	---	.99919	12	-(3.48)	45
29	11,793	.0273	11,471	10,454	---	---	.99919	60	60.97	42
32	14,529	.0273	14,132	13,040	---	---	.99838	60	65.44	37
39	18,975	.0273	18,457	16,309	---	---	.99643	120	256.84	30
49	24,200	.0644	22,642	18,263	---	---	.99085	120	520.61	20
59	59,160	.1898	47,931	17,823	---	---	.97773	120	3,532.55	10
68	59,160	.1898	47,931	16,879	---	---	.94954	72	2,122.93	1

Private Rate of Return: 10.0277

TABLE 127

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, 3 YRS UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
26	23,299	.0644	21,799	10,454	---	---	.99919	24	272.05	43
28	23,299	.0644	21,799	10,454	---	---	.99919	36	408.06	41
32	30,148	.0644	28,206	13,040	---	---	.99838	60	908.51	37
39	28,407	.0644	26,578	16,309	---	---	.99643	120	1,227.83	30
49	28,655	.0644	26,810	18,263	---	---	.99085	120	1,016.21	20
59	26,722	.0644	29,001	17,823	---	---	.97773	120	842.19	10
68	19,665	.0273	19,128	16,879	---	---	.94954	72	153.77	1

Private Rate of Return: 24.4992

TABLE 128

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, 4 YRS UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
25	---	---	---	10,454	6,177	428	.99919	12	-(56.41)	44
28	16,635	.0273	16,181	10,454	---	---	.99919	48	274.67	41
32	21,513	.0644	20,128	13,040	---	---	.99838	60	424.56	37
39	22,343	.0644	20,904	16,309	---	---	.99643	120	549.44	30
49	21,895	.0644	20,485	18,263	---	---	.99085	120	264.20	20
59	21,430	.0644	20,050	17,823	---	---	.97773	120	261.28	10
68	19,183	.0273	18,659	16,879	---	---	.94954	72	121.71	1

Private Rate of Return: 12.0689

TABLE 129

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, 5 YRS UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
26	---	---	---	10,454	6,177	428	.99919	24	-(112.82)	43
28	24,682	.0644	23,092	10,454	---	---	.99919	36	454.62	41
32	30,559	.0644	28,991	13,040	---	---	.99838	60	931.55	37
39	37,665	.0644	35,239	16,309	---	---	.99643	120	2,263.54	30
49	34,723	.0644	32,487	18,263	---	---	.99085	120	1,691.24	20
59	32,127	.0644	30,058	17,823	---	---	.97773	120	1,435.51	10
68	40,588	.0644	37,974	16,879	---	---	.94954	72	1,441.21	1

Private Rate of Return: 20.4910

TABLE 130

PRIVATE RATE OF RETURN CALCULATIONS
NORTH REGION, 6 YRS UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc./Mo.	Net Stud. Inc./Mo.	Dir.Univ. Costs/Mo.	Mortality	Mos. in Period	Flow Per Period Cr$x1,000	Yrs. to End
19	---	---	---	5,573	3,350	---	------	24	-(53.35)	50
21	---	---	---	7,884	3,600	---	.99971	24	-(102.79)	48
23	---	---	---	7,884	3,920	396	.99971	36	-(156.91)	46
26	---	---	---	10,454	6,177	428	.99919	36	-(169.24)	43
29	28,307	.0644	26,484	10,454	---	---	.99919	24	384.41	40
32	40,126	.0644	37,542	13,040	---	---	.99838	60	1,467.73	37
39	43,522	.0644	40,719	16,309	---	---	.99643	120	2,918.76	30
49	39,940	.0644	37,368	18,263	---	---	.99085	120	2,271.61	20
59	34,918	.0644	32,669	17,823	---	---	.97773	120	1,741.88	10
68	26,387	.0644	24,688	16,879	---	---	.94954	72	533.85	1

Private Rate of Return: 21.5004

TABLE 131

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	---	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	7,594 20,937	3,920	.99971	36	-(420.68)	46	-(900.89)
25	---	10,748	7,594 20,937	6,280	.99919	18	-(216.94)	44	-(456.92)
27	23,513	10,748	---	---	.99919	42	535.70	42	535.70
32	29,317	13,406	---	---	.99838	60	953.11	37	953.11
39	32,384	16,767	---	---	.99643	120	1,867.35	30	1,867.35
49	29,976	18,776	---	---	.99085	120	1,331.70	20	1,331.70
59	27,364	18,323	---	---	.97773	120	1,060.76	10	1,060.76
68	27,354	17,353	---	---	.94954	72	683.74	1	683.74

Social Rates of Return: 15.0278 9.0321

TABLE 132

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, PHILOSOPHY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period w/O Capital Cost Cr$x1,000	Yrs. to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	3,458 11,730	3,920	.99971	36	-(271.83)	46	-(569.53)
25	---	10,748	3,458 11,730	6,280	.99919	6	-(47.52)	44	-(97.11)
27	14,022	10,748	---	---	.99919	54	176.65	42	176.65
32	21,724	13,406	---	---	.99838	60	498.27	37	498.27
39	12,228	16,767	---	---	.99643	120	-(542.74)	30	-(542.74)
49	29,544	18,776	---	---	.99085	120	1,280.34	20	1,280.34
59	8,239	18,323	---	---	.97773	120	-(1,183.13)	10	-(1,183.13)
68	13,555	17,353	---	---	.94954	72	-(259.66)	1	-(259.66)

Social Rates of Return: < 0 < 0

TABLE 133

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, MEDICINE GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$xl,000	Yrs.to End	Flow/ Period with Capital Costs Cr$xl,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	15,967 45,053	3,920	.99971	36	-(722.02)	46	-(1,768.81)
27	---	10,748	15,967 45,053	6,280	.99919	36	-(735.06)	43	-(1,781.31)
29	28,035	10,748	---	---	.99919	24	414.55	40	414.55
32	38,538	13,406	---	---	.99838	60	1,505.48	37	1,505.48
39	43,351	16,767	---	---	.99643	120	3,178.69	30	3,178.69
49	39,940	18,776	---	---	.99085	120	2,516.44	20	2,516.44
59	34,926	18,323	---	---	.97773	120	1,947.99	10	1,947.99
68	26,387	17,353	---	---	.94954	72	617.63	1	617.63

Social Rates of Return: 11.8680 5.6414

TABLE 134

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, PHARMACY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period w/O Capital Cost Cr$x1,000	Yrs. to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-105.93)	48	-(105.93)
23	---	8,015	13,039 28,516	3,920	.99971	36	-(616.65)	46	-(1,173.66)
25	---	10,748	13,039 28,516	6,280	.99919	6	-(104.96)	44	-(197.74)
27	16,134	10,748	---	---	.99919	54	290.61	42	290.61
32	16,371	13,406	---	---	.99838	60	177.61	37	177.61
39	25,473	16,767	---	---	.99643	120	1,040.99	30	1,040.99
49	17,301	18,776	---	---	.99085	120	-(175.38)	20	-(175.38)
59	21,342	18,323	---	---	.97773	120	354.21	10	354.21
68	8,000	17,353	---	---	.94954	72	-(639.44)	1	-(639.44)

Social Rates of Return: 3.3609 < 0

TABLE 135

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, DENTISTRY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	8,210 21,285	3,920	.99971	36	-(442.85)	46	-(913.42)
25	---	10,748	8,210 21,285	6,280	.99919	12	-(152.01)	44	-(308.79)
27	13,520	10,748	---	---	.99919	48	132.95	42	132.95
32	28,056	13,406	---	---	.99838	60	877.58	37	877.58
39	22,664	16,767	---	---	.99643	120	705.11	30	705.11
49	21,529	18,776	---	---	.99085	120	327.34	20	327.34
59	19,714	18,323	---	---	.97773	120	163.20	10	163.20
68	21,181	17,353	---	---	.94954	72	261.71	1	261.71
					Social Rates of Return:		8.4077		3.6383

TABLE 136

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, ENGINEERING GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs. to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	9,441 26,786	3,920	.99971	36	-(487.15)	46	-(1,111.39)
26	---	10,748	9,441 26,786	6,280	.99919	24	-(333.55)	43	-(749.49)
28	28,770	10,748	---	---	.99919	36	648.27	41	648.27
32	40,260	13,406	---	---	.99838	60	1,608.63	37	1,608.63
39	39,991	16,767	---	---	.99643	120	2,776.93	30	2,776.93
49	39,248	18,776	---	---	.99085	120	2,434.16	20	2,434.16
59	45,881	18,323	---	---	.97773	120	3,233.31	10	3,233.31
68	34,245	17,353	---	---	.94954	72	1,154.86	1	1,154.85
					Social Rates of Return:		17.2976		10.5825

TABLE 137

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, LAW GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	1,916 5,385	3,920	.99971	36	-(216.33)	46	-(341.18)
26	---	10,748	1,916 5,385	6,280	.99919	24	-(153.09)	43	-(236.28)
28	22,450	10,748	---	---	.99919	36	420.93	41	420.93
32	24,428	13,406	---	---	.99838	60	660.25	37	660.25
39	35,777	16,767	---	---	.99643	120	2,273.06	30	2,273.06
49	36,549	18,776	---	---	.99085	120	2,113.25	20	2,113.25
59	29,813	18,323	---	---	.97773	120	1,348.09	10	1,348.09
68	52,220	17,353	---	---	.94954	72	2,383.75	1	2,383.75
				Social Rates of Return:			17.3895		14.7299

TABLE 138

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, AGRONOMY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	16,499 38,114	3,920	.99971	36	-(741.17)	46	-(1,519.08)
25	---	10,748	16,499 38,114	6,280	.99919	12	-(251.40)	44	-(510.57)
27	13,743	10,748	---	---	.99919	48	143.64	42	143.64
32	17,056	13,406	---	---	.99838	60	218.65	37	218.65
39	29,313	16,767	---	---	.99643	120	1,500.15	30	1,500.15
49	20,830	18,776	---	---	.99085	120	214.22	20	214.22
59	25,173	18,323	---	---	.97773	120	803.69	10	803.69
68	20,937	17,353	---	---	.94954	72	245.03	1	245.03
					Social Rates of Return:		5.1554		1.6970

TABLE 139

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, ECON/POL SCIENCES GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period W/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	5,267 9,403	3,920	.99971	36	-(336.93)	46	-(485.79)
25	---	10,748	5,267 9,403	6,280	.99919	12	-(116.73)	44	-(166.32)
27	16,733	10,748	---	---	.99919	48	287.05	42	287.05
32	24,342	13,406	---	---	.99838	60	655.10	37	655.10
39	29,544	16,767	---	---	.99643	120	1,527.77	30	1,527.77
49	26,388	18,776	---	---	.99085	120	905.08	20	905.08
59	22,913	18,323	---	---	.97773	120	538.53	10	538.53
68	35,000	17,353	---	---	.94954	72	1,206.47	1	1,206.47
							Social Rates of Return:	16.1333	10.8347

TABLE 140

SOCIAL RATE OF RETURN CALCULATIONS
NORTH REGION, GRADUATES OF OTHER COURSES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/ Period w/O Capital Cost Cr$x1,000	Yrs.to End	Flow/ Period with Capital Costs Cr$x1,000
19	---	5,573	---	3,350	------	24	-(53.35)	50	-(53.35)
21	---	8,015	---	3,600	.99971	24	-(105.93)	48	-(105.93)
23	---	8,015	7,594 20,937	3,920	.99971	36	-(420.68)	46	-(900.89)
25	---	10,748	7,594 20,937	6,280	.99919	12	-(144.63)	44	-(304.67)
27	32,900	10,748	---	---	.99919	48	1,062.43	42	1,062.43
32	33,031	13,406	---	---	.99838	60	1,175.59	37	1,175.59
39	33,569	16,767	---	---	.99643	120	2,009.04	30	2,009.04
49	28,312	18,776	---	---	.99085	120	1,133.85	20	1,133.85
59	28,772	18,323	---	---	.97773	120	1,225.96	10	1,225.96
68	18,564	17,353	---	---	.94954	72	82.79	1	82.79
						Social Rates of Return:	21.4463		13.2562

TABLE 141

PRIVATE RATE OF RETURN CALCULATIONS
GUANABARA - ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
25	--	--	--	15,184	6240	894	.99919	18	-(176.94)	44
27	26,606	.0644	24,893	15,184	--	--	.99919	42	407.43	42
32	36,646	.0644	34,286	19,427	--	--	.99838	60	890.10	37
39	48,258	.0644	45,150	22,219	--	--	.99643	120	2,741.92	30
49	57,873	.1898	46,889	26,928	--	--	.99085	120	2,373.37	20
59	59,868	.1898	48,505	29,006	--	--	.97773	120	2,287.78	10
68	51,149	.1898	40,929	24,662	--	--	.94954	72	1,112.15	1

Private Rate of Return: 16.74

TABLE 142

PRIVATE RATE OF RETURN CALCULATIONS

GUANABARA - PHILOSOPHY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
25	--	--	--	15,184	6240	894	.99919	6	-(58.98)	44
27	17,895	.0273	17,406	15,184			.99919	54	119.92	42
32	23,661	.0644	22,137	19,427			.99838	60	162.35	37
39	30,928	.0644	28,936	22,219			.99643	120	803.19	30
49	35,736	.0644	33,435	26,938			.99085	120	773.65	20
59	32,637	.0644	30,535	29,006			.97773	120	179.41	10
68	24,260	.0644	22,698	24,662			.94954	72	-(134.30)	1

Private Rate of Return: 7.28

TABLE 143

PRIVATE RATE OF RETURN CALCULATIONS
GUANABARA - MEDICINE GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
27	--	--	--	15,184	6240	894	.99919	36	-(353.88)	42
29	21,391	.0644	20,013	15,184	--		.99919	24	115.81	40
32	33,811	.0644	31,634	19,427	--		.99838	60	731.21	37
39	46,749	.0644	43,738	22,219	--		.99643	120	2,573.10	30
49	58,388	.1898	47,306	26,928	--		.99085	120	2,422.98	20
59	61,817	.1898	50,084	29,006	--		.97773	120	2,473.05	10
68	58,459	.1898	47,363	24,662	--		.94954	72	1,552.03	1

Private Rate of Return: 13.21

TABLE 144

PRIVATE RATE OF RETURN CALCULATIONS
GUANABARA - PHARMACY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
25	--	--	--	15,184	6240	894	.99919	6	-(58.98)	44
27	18,604	.0273	18,096	15,184	--	--	.99919	54	157.13	42
32	21,243	.0644	19,875	19,427	--	--	.99838	60	26.83	37
39	24,989	.0644	23,380	22,219	--	--	.99643	120	138.79	30
49	37,551	.0644	35,133	26,928	--	--	.99085	120	975.56	20
59	30,034	.0644	28,100	29,006	--	--	.97773	120	-(106.32)	10
68	17,760	.0273	17,275	24,662	--	--	.94954	72	-(505.02)	1

Private Rate of Return: 2.75

TABLE 145

PRIVATE RATE OF RETURN CALCULATIONS
GUANABARA - DENTISTRY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	-----	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
25	--	--	--	15,184	6240	894	.99919	12	-(117.96)	44
27	19,000	.0273	18,481	15,184	--	--	.99919	48	158.14	42
32	25,550	.0644	23,905	19,427	--	--	.99838	60	268.22	37
39	32,582	.0644	30,484	22,219	--	--	.99643	120	988.23	30
49	32,392	.0644	30,306	26,928	--	--	.99085	120	401.65	20
59	30,859	.0644	28,872	29,006	--	--	.97773	120	-(15.76)	10
68	30,222	.0644	28,276	24,662	--	--	.94954	72	247.06	1

Private Rate of Return: 7.68

TABLE 146

PRIVATE RATE OF RETURN CALCULATIONS
GUANABARA - ENGINEERING GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
26	--	--	--	15,184	6204	894	.99919	24	-(235.92)	43
28	40,871	.0644	38,239	15,184	--	--	.99919	36	829.30	41
32	60,708	.1898	49,186	19,427	--	--	.99838	60	1,782.62	37
39	74,538	.1898	60,391	22,219	--	--	.99643	120	4,564.25	30
49	70,235	.1898	56,904	26,928	--	--	.99085	120	3,564.25	20
59	74,469	.1898	60,335	29,006	--	--	.97773	120	3,675.73	10
68	55,337	.1898	44,834	24,662	--	--	.94954	72	1,379.10	1

Private Rate of Return: 22.70

TABLE 147

PRIVATE RATE OF RETURN CALCULATIONS
GUANABARA - LAW GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	----	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
26	--	--	--	15,184	6240	894	.99919	24	-(235.92)	43
28	27,850	.0644	26,056	15,184	--	--	.99919	36	391.09	41
32	37,930	.0644	35,487	19,427	--	--	.99838	60	962.06	37
39	50,698	.1898	41,076	22,219	--	--	.99643	120	2,254.70	30
49	64,690	.1898	52,412	26,928	--	--	.99085	120	3,030.08	20
59	66,780	.1898	54,105	29,006	--	--	.97773	120	2,944.82	10
68	64,020	.1898	51,869	24,662	--	--	.94954	72	1,860.06	1

Private Rate of Return: 15.90

TABLE 148

PRIVATE RATE OF RETURN CALCULATIONS
GUANABARA - AGRONOMY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643		------	24	-(78.46)	50
21	--	--	--	10,828	4643		.99971	24	-(148.40)	48
23	--	--	--	10,828	4643		.99971	36	-(244.87)	46
27	--	--	--	15,184	6240		.99919	12	-(118.02)	44
29	28,319	.0644	26,495	15,184	--		.99919	48	542.50	42
32	32,914	.0644	30,794	19,427	--		.99838	60	680.94	37
39	36,277	.0644	33,941	22,219	--		.99643	120	1,401.59	30
49	32,711	.0644	30,604	26,928	--		.99085	120	437.13	20
59	57,490	.1898	46,578	29,006	--		.97773	120	2,061.73	10
68	25,719	.0644	24,063	24,662	--		.94954	72	-(40.97)	1

Private Rate of Return: 15.18

TABLE 149

PRIVATE RATE OF RETURN CALCULATIONS

GUANABARA - ECONOMIC AND POLITICAL SCIENCES GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244,87)	46
27	--	--	--	15,184	6240	894	.99919	12	-(117.96)	44
29	33,627	.0644	31,461	15,184	--	--	.99919	48	780.68	42
32	37,037	.0644	34,652	19,427	--	--	.99838	60	912.01	37
39	54,402	.1898	44,077	22,219	--	--	.99643	120	2,613.54	30
49	59,538	.1898	48,238	26,928	--	--	.99085	120	2,580.78	20
59	65,450	.1898	53,028	29,006	--	--	.97773	120	2,818.40	10
68	43,784	.0644	40,964	24,662	--	--	.94954	72	1,114.54	1

Private Rate of Return: 20.32

TABLE 150

PRIVATE RATE OF RETURN CALCULATIONS

GUANABARA - "OTHER" COURSES COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
25	--	--	--	15,184	6240	894	.99919	12	-(117.96)	44
27	29,767	.0644	27,850	15,184	--	--	.99919	48	608.46	42
32	38,440	.0644	35,964	19,427	--	--	.99838	60	990.64	37
39	48,516	,0644	45,392	22,219	--	--	.99643	120	2,770.78	30
49	63,667	.1898	51,583	26,928	--	--	.99085	120	2,931.53	20
59	65,622	.1898	53,167	29,006	--	--	.97773	120	2,834.75	10
68	63,665	.1898	51,581	24,662	--	--	.94954	72	1,840.39	1

Private Rate of Return: 19.38

TABLE 151

PRIVATE RATE OF RETURN CALCULATIONS

GUANABARA - ONE YEAR UNIVERSITY COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
22	--	--	--	10,828	4643	619	.99971	12	-(81.62)	47
24	11,224	.0273	10,918	15,184	--	--	.99919	24	-(102.31)	45
27	16,215	.0273	15,772	15,184	--	--	.99919	60		42
32	19,420	.0273	18,890	19,427	--	--	.99838	60	-(32.18)	37
39	23,383	.0644	21,877	22,219	--	--	.99643	120	-(40.88)	30
49	35,651	.0644	33,355	26,928	--	--	.99085	120	764.19	20
59	52,525	.1898	42,556	29,006	--	--	.97773	120	1,589.76	10
68	31,225	.0644	29,214	24,662	--	--	.94954	72	311.21	1

Private Rate of Return: 5.47

TABLE 152

PRIVATE RATE OF RETURN CALCULATIONS

GUANABARA - TWO YEARS UNIVERSITY COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	24	-(163.24)	46
24	10,541	.0273	10,253	15,184	--	--	.99919	12	-(59.12)	45
29	16,699	.0273	16,245	15,184	--	--	.99919	60	63.50	42
32	22,376	.0644	20,935	19,427	--	--	.99838	60	90.33	37
39	25,293	.0644	23,664	22,219	--	--	.99643	120	172.80	30
49	33,937	.0644	41,751	26,928	--	--	.99085	120	573.52	20
59	37,323	.0644	34,919	29,006	--	--	.97773	120	693.80	10
68	67,695	.1898	54,846	24,662	--	--	.94954	72	2,063.62	1

Private Rate of Return: 6.35

TABLE 153

PRIVATE RATE OF RETURN CALCULATIONS

GUANABARA - THREE YEARS UNIVERSITY COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
26	--	--	--	15,184	6240	894	.99919	24	-(235.92)	43
28	26,491	.0644	24,879	15,184	--	--	.99919	36	348.72	41
32	34,554	.0644	32,329	19,427	--	--	.99838	60	772.85	37
39	45,884	.0644	42,929	22,219	--	--	.99643	120	2,476.34	30
49	61,816	.1898	50,083	26,928	--	--	.99085	120	2,753.21	20
59	65,389	.1898	52,978	29,006	--	--	.97773	120	2,812.60	10
68	56.973	.1898	46,160	24,662	--	--	.94954	72	1,469.72	1

Private Rate of Return: 15.21

TABLE 154

PRIVATE RATE OF RETURN CALCULATIONS

GUANABARA - FOUR YEARS UNIVERSITY COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	------	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
25	--	--	--	15,184	6240	894	.99919	12	-(117.96)	44
28	20,774	.0644	19,436	15,184	--	--	.99919	48	203.94	41
32	26,998	.0644	25,259	19,427	--	--	.99838	60	349.37	37
39	36.126	.0644	33,799	22,219	--	--	.99643	120	1,384.70	30
49	40,435	.0644	37,831	26,928	--	--	.99085	120	1,296.39	20
59	37,399	.0644	34,991	29,006	--	--	.97773	120	702.15	10
68	29,962	.0644	28,032	24,662	--	--	.94954	72	230.43	1

Private Rate of Return: 10.78

TABLE 155

PRIVATE RATE OF RETURN CALCULATIONS

GUANABARA - FIVE YEARS UNIVERSITY COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	7,912	4643	--	-----	24	-(78.46)	50
21	--	--	--	10,828	4643	--	.99971	24	-(148.40)	48
23	--	--	--	10,828	4643	619	.99971	36	-(244.87)	46
26	--	--	--	15,184	6240	894	.99919	24	-(239.92)	43
28	31,592	.0644	29,557	15,184	--	--	.99919	36	517.03	41
32	44,928	.0644	42,035	19,427	--	--	.99838	60	1,354.26	37
39	57,974	.1898	46,972	22,219	--	--	.99643	120	2,959,58	30
49	66,067	.1898	53,527	26.928	--	--	.99085	120	3,162.73	20
59	69,654	.1898	56,434	29,006	--	--	.97773	120	3,218.02	10
68	59,322	.1898	48,063	24,662	--	--	.94954	72	1,599.83	1

Private Rate of Return: 18.60

TABLE 156

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	7,594 20,937	4643	.99971	36	-(506.84)	46	-(987.05)
25	--	15,610	7,594 20,937	6344	.99919	18	-(303.23)	44	-(543.21)
27	26,606	15,610	--	--	.99919	42	461.46	42	461.46
32	36,646	19,972	--	--	.99838	60	998.82	37	998.82
39	48,258	23,748	--	--	.99643	120	2,930.70	30	2,930.70
49	57,873	28,781	--	--	.99085	120	3,459.10	20	3,459.10
59	59,868	31,003	--	--	.97773	120	3,386.66	10	3,386.66
68	51,149	26,360	--	--	.94954	72	1,694.75	1	1,694.75
					Social Rates of Return:		14.08		10.23

TABLE 157

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - PHILOSOPHY

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	3,458 11,730	4643	.99971	36	-(357.99)	46	-(655.69)
25	--	15,610	3,458 11,730	6344	.99919	6	-(76.28)	44	-(125.87)
27	17,895	15,610	--	--	.99919	54	123.29	42	123.29
32	23,661	19,972	--	--	.99838	60	220.98	37	220.98
39	30,928	23,748	--	--	.99643	120	858.52	30	858.52
49	35,736	23,781	--	--	.99085	120	826.96	20	826.96
59	32,637	31,003	--	--	.97773	120	191.71	10	191.71
68	24,260	26,360	--	--	.94954	72	-(143.57)	1	-(143.57)
				Social Rates of Return:			6.50		4.02

TABLE 158

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - MEDICINE

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	15,967 45,053	4643	.99971	36	-(808.18)	46	-(1,854.97)
27	--	15,610	15,967 45,053	6344	.99919	36	-(907.65)	42	-(1,9 3.90)
29	21,391	15,610	--		.99919	24	138.63	40	138.63
32	33,811	19,972	--		.99838	60	828.99	37	828.99
39	46,749	23,748	--		.99643	120	2,750.26	30	2,750.26
49	58,388	28,781	--		.99085	120	3,520.33	20	3,520.33
59	61,817	31,003	--		.97773	120	3,615.33	10	3,615.33
68	58,459	26,360	--		.94954	72	2,194.51	1	2,194.51
					Social Rates of Return:		8.96		5.03

TABLE 159

SOCIAL RATE OF RETURN CALCULATIONS

GUANABARA - PHARMACY

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	13,039 28,516	4643	.99971	36	-(774.78)	46	-(1,259.81)
25	--	15,610	13,039 28,516	6344	.99919	6	-(133.72)	44	-(226.51)
27	18,604	15,610	--	--	.99919	54	161.55	42	161.55
32	21,243	19,972	--	--	.99838	60	76.15	37	76.14
39	24.989	23,748	--	--	.99643	120	148.39	30	148.39
49	37,551	28,781	--	--	.99085	120	1,042.77	20	1,042.77
59	30,034	31,003	--	--	.97773	120	113.69	10	113.69
68	17.760	26,360	--	--	.94954	72	-(587.96)	1	-(587.96)
					Social Rates of Return:		< 0		< 0

TABLE 160

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - DENTISTS

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	8,210 21,285	4643	.99971	36	-(527.63)	46	-(999.57)
25	--	15,610	8,210 21,285	6344	.99919	12	-(209.54)	44	-(366.32)
27	19,000	15,610	--	--	.99919	48	162.59	42	162.59
32	25,550	19,972	--	--	.99838	60	334.14	37	334.14
39	32,582	23,748	--	--	.99643	120	1,056.30	30	1,056.30
49	32,392	28,781	--	--	.99085	120	429.36	20	429.36
59	30,859	31,003	--	--	.97773	120	-(16.90)	10	-(16.90)
68	30,222	26,360	--	--	.94954	72	264.03	1	264.03
					Social Rates of Return:		4.94		1.83

TABLE 161

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - ENGINEERING

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	9,441 26,786	4643	.99971	36	-(573.31)	46	-(1,197.55)
26	--	15,610	9,441 26,786	6344	.99919	24	-(448.60)	43	-(864.55)
28	40,871	15,610	--	--	.99919	36	908.66	41	908.66
32	60,708	19,972	--	--	.99838	60	2,440.20	37	2,440.20
39	74,538	23,748	--	--	.99643	120	6,073.04	30	6,073.04
49	70,235	28,781	--	--	.99085	120	4,928.96	20	4,928.96
59	74,469	31,003	--	--	.97773	120	5,099.76	10	5,099.76
68	55,337	26,360	--	--	.94954	72	1,981.07	1	1,981.07
					Social Rates of Return:		19.92		14.27

TABLE 162

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - LAW

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	1,916 5,385	4643	.99971	36	-(302.49)	46	-(588.50)
26	--	15,610	1,916 5,385	6344	.99919	24	-(268.15)	43	-(351.34)
28	27,850	15,610	--	--	.99919	36	440.28	41	440.28
32	37,930	19,972	--	--	.99838	60	1,075.73	37	1,075.73
39	50,698	23,748	--	--	.99643	120	3,222.45	30	3,222.45
49	64,690	28,781	--	--	.99085	120	4,269.65	20	4,269.65
59	66,780	31,003	--	--	.97773	120	4,197.63	10	4,197.63
68	64,020	26,360	--		.94954	72	2,574.70	1	2,574.70
					Social Rates of Return:		16.75		13.83

TABLE 163

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - AGRONOMY

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	16,499 38,114	4643	.99971	36	-(827.33)	46	-(1,605.24)
27	--	15,610	16,499 38,114	6344	.99919	12	-(329.40)	44	-(568.10)
29	28,319	15,610	--	--	.99919	48	609.54	42	609.54
32	32,914	19,972	--	--	.99838	60	775.26	37	775.26
39	36,277	23,748	--	--	.99643	120	1,498.11	30	1,498.11
49	32,711	28,781	--	--	.99085	120	467.28	20	467.28
59	57,490	31,003	--	--	.97773	120	3,107.66	10	3,107.66
68	25,719	26,360	--	--	.94954	72	-(43.82)	1	-(43.82)
					Social Rates of Return:		8.70		4.89

TABLE 164

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - ECONOMIC AND POLITICAL SCIENCES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	5,267 9,403	4643	.99971	36	-(423.09)	46	-(571.95)
27	--	15,610	5,267 9,403	6344	.99919	12	-(174.25)	44	-(223.85)
29	33,627	15,610	--	--	.99919	48	864.12	42	864.12
32	37,037	19,972	--	--	.99838	60	1,022.24	37	1,022.24
39	54,402	23,748	--	--	.99643	120	3,665.35	30	3,665.35
49	59,538	28,781	--	--	.99085	120	3,657.07	20	3,657.07
59	65,450	31,003	--	--	.97773	120	4,041.58	10	4,041.58
68	43,784	26,360	--	--	.94954	72	1,191.22	1	1,191.22
					Social Rates of Return:		18.86		16.83

TABLE 165

SOCIAL RATE OF RETURN CALCULATIONS
GUANABARA - OTHER COURSES COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	8044	--	4643	------	24	-(81.62)	50	-(81.62)
21	--	11,132	--	4643	.99971	24	-(155.69)	48	-(155.69)
23	--	11,132	7,594 20,937	4643	.99971	36	-(506.84)	46	-(987.05)
25	--	15,610	7,594 20,937	6344	.99919	12	-(202.16)	44	-(362.14)
27	29,767	15,610	--	--	.99919	48	678.99	42	678.99
32	38,440	19,972	--	--	.99838	60	1,106.28	37	1,106.28
39	48,516	23,748	--	--	.99643	120	2,961.55	30	2,961.55
49	63,667	28,781	--	--	.99085	120	4,148.02	20	4,148.02
59	65,622	31,003	--	--	.97773	120	4,061.76	10	4,061.76
68	63,665	26,360	--	--	.94954	72	2,550.43	1	2,550.43
					Social Rates of Return:		16.36		12.08

TABLE 166

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	-----	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
25	--	--	--	10,894	4,689	621	.99919	18	-(122.77)	44
27	19,970	.0273	19,425	10,894	--	--	.99919	42	358.00	42
32	26,009	,0644	24,334	12,737	--	--	.99838	60	694.69	37
39	27,590	.0644	25,813	14,857	--	--	.99643	120	1,310.05	30
49	28,111	.0644	26,301	17,421	--	--	.99085	120	1,055.81	20
59	21,932	.0644	20,520	15,902	--	--	.97773	120	541.77	10
68	24,830	.0644	23,231	13,767	--	--	.94954	72	647.02	1

Private Rate of Return: 21.88

TABLE 167

PRIVATE RATE OF RETURN CALCULATIONS
SANTA CATARINA - PHILOSOPHY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	------	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
25	--	--	--	10,894	4,689	621	.99919	6	-(40.92)	44
27	13,049	.0273	12,693	10,894	--	--	.99919	54	97.05	42
32	13,864	.0273	13,486	12,737	--	--	.99838	60	44.87	37
39	10,948	.0273	10,649	14,857	--	--	.99643	120	-(503.14)	30
49	13,706	.0273	13,332	17,421	--	--	.99085	120	-(486.21)	20
59	19,674	.0273	19,138	15,902	--	--	.97773	120	379.66	10
68	13,307	.0273	12,944	13,767	--	--	.94954	72	-(56.29)	1

Private Rate of Return: < 0

TABLE 168

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - MEDICINE GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	------	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	--(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
27	--	--	--	10,894	4,689	621	.99919	36	-(245.54)	43
29	33,436	.0644	31,283	10,894	--	--	.99919	24	488.93	40
32	46,799	.0644	43,785	12,737	--	--	.99838	60	1,859.87	37
39	39,884	.0644	37,315	14,857	--	--	.99643	120	2,685.40	30
49	45,764	.0644	42,817	17,421	--	--	.99085	120	3,019.61	20
59	29,946	.0644	28,017	15,902	--	--	.97773	120	1,421.48	10
68	36,201	.0644	33,870	13,767	--	--	.94954	72	1,374.36	1

Private Rate of Return: 27.16

TABLE 169

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - PHARMACY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	-----	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
25	--	--	--	10,894	4,689	621	.99919	6	-(40.92)	44
27	14,120	.0273	13,735	10,894	--	--	.99919	54	153.26	42
32	15,922	.0273	15,487	12,737	--	--	.99838	60	164.75	37
39	18,927	.0273	18,410	14,857	--	--	.99643	120	424.87	30
49	19,836	.0273	19,294	17,421	--	--	.99085	120	222.76	20
59	27,913	.0644	21,437	15,902	--	--	.97773	120	649.46	10
68	22,913	.0644	21,437	13,767	--	--	.94954	72	524.40	1

Private Rate of Return: 11.51

TABLE 170

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - DENTISTRY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	------	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
25	--	--	--	10,894	4,689	621	.99919	12	-(81.85)	44
27	13,710	.0273	13,336	10,894	--	--	.99919	48	117.11	42
32	20,334	.0644	19,024	12,737	--	--	.99838	60	376.64	37
39	22,929	.0644	21,452	14,857	--	--	.99643	120	788.62	30
49	24,052	.0644	22,503	17,421	--	--	.99085	120	604.27	20
59	20,610	.0644	19,283	15,902	--	--	.97773	120	396.65	10
68	16,134	.0273	15,694	13,767	--	--	.94954	72	131.71	1

Private Rate of Return: 14.15

TABLE 171

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - ENGINEERING GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	-----	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
26	--	--	--	10,894	4,689	621	.99919	24	-(163.69)	43
28	26,319	.0644	24,624	10,894	--	--	.99919	36	493.88	41
32	26,034	.0644	24,357	12,737	--	--	.99838	60	696.10	37
39	40,833	.0644	38,203	14,857	--	--	.99643	120	2,791,56	30
49	24,337	.0644	22,770	17,421	--	--	.99085	120	635.97	20
59	27,768	.0644	25,980	15,902	--	--	.97773	120	1,182.40	10
68	20,435	.0644	19,119	13,767	--	--	.94954	72	364.90	1

Private Rate of Return: 24.41

TABLE 172

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - LAW GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	---'---	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
26	--	--	--	10,894	4,689	621	.99919	24	-(163.69)	43
28	22,817	.0644	21,348	10,894	--	--	.99919	36	376.02	41
32	28,507	.0644	26,671	12,737	--	--	.99838	60	834.69	37
39	27,862	.0644	26.068	14,857	--	--	.99643	120	1,340.48	30
49	38,011	.0644	35,563	17,421	--	--	.99085	120	2,157.53	20
59	19,895	.0273	19,352	15,902	--	--	.97773	120	404.76	10
68	70,473	.1898	57.097	13,767	--	--	.94954	72	2,962.35	1

Private Rate of Return: 21.93

TABLE 173

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - AGRONOMY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	-----	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
25	--	--	--	10,894	4,689	621	.99919	12	-(81.85)	44
27	37,827	.0644	35,391	10,894	--	--	.99919	48	1,174.90	42
32	37,409	.0644	35,000	12,737	--	--	.99838	60	1,333.61	37
39	7,101	-0-	7,101	14,857	--	--	.99643	120	-(927.40)	30
49	35,606	.0644	33,313	17,421	--	--	.99085	120	1,889.59	20
59	30,916	.0644	28,925	15,902	--	--	.97773	120	1,527.96	10
68	30,916	.0644	28,925	13,767	--	--	.94954	72	1,036.31	1

Private Rate of Return: 40.63

TABLE 174

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - ECONOMIC AND POLITICAL SCIENCE GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	------	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
25	--	--	--	10,894	4,689	621	.99919	12	-(81.85)	44
27	16,134	.0273	15,694	10,894	--	--	.99919	48	230.19	42
32	17,938	.0273	17,448	12,737	--	--	.99838	60	282.22	37
39	24,406	.0644	22,834	14,857	--	--	.99643	120	953.85	30
49	36,447	.0644	34,100	17,421	--	--	.99085	120	1,983.14	20
59	10,954	.0273	10,655	15,902	--	--	.97773	120	-(615.62)	10
68	15,000	.0273	14,590	13,767	--	--	.94954	72	56.30	1

Private Rate of Return: 16.82

TABLE 175

PRIVATE RATE OF RETURN CALCULATIONS

SANTA CATARINA - "OTHER" COURSES COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Effective Tax Rate	Net Inc. Per Mo.	Net Sec. Inc. Per Mo.	Net Student Inc. Per Mo.	Dir. Univ. Costs Per Mo.	Mortality	Mos. in Period	Flow Per Period Cr$ x 1,000	Yrs. to End
19	--	--	--	5,256	4,700	--	------	24	-(13.34)	50
21	--	--	--	7,746	4,700	--	.99971	24	-(73.08)	48
23	--	--	--	7,746	4,700	305	.99971	36	-(120.60)	46
25	--	--	--	10,894	4,689	621	.99919	12	-(81.85)	44
27	23,804	.0644	22,271	10,894	--	--	.99919	48	454.65	42
32	27,241	.0644	25,487	12,737	--	--	.99838	60	763.74	37
39	20.978	.0644	19,627	14,857	--	--	.99643	120	570.36	30
49	28,606	.0644	26,764	17,421	--	--	.99085	120	1,110.87	20
59	16,264	.0273	15,820	15,902	--	--	.97773	120	-(9.62)	10
68	26,388	.0644	24,689	13,767	--	--	.94954	72	746.68	1

Private Rate of Return: 26.39

TABLE 176

SOCIAL RATE OF RETURN CALCULATIONS

SANTA CATARINA - ALL UNIVERSITY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.34)	50	(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	7,594 20,937	4,700	.99971	36	-(387.57)	46	-(867.78)
25	--	11,200	7,594 20,937	4,689	.99919	18	-(253.68)	44	-(493.66)
27	19,970	11,200	--	--	.99919	42	368.04	42	368.04
32	26,009	13,094	--	--	.99838	60	773.64	37	773.64
39	27,590	15,274	--	--	.99643	120	1,472.64	30	1,472.64
49	8,111	17,910	--	--	.99085	120	1,212.92	20	1,212.92
59	21,932	16,348	--	--	.97773	120	655.16	10	655.16
68	24,830	14,153	--	--	.94954	72	729.95	1	729.95
					Social Rates of Return:		13.70		7.52

TABLE 177

SOCIAL RATE OF RETURN CALCULATIONS

SANTA CATARINA - PHILOSOPHY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.34)	50	-(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	3,458 11,730	4,700	.99971	36	-(238.72)	46	-(536.42)
25	--	11,200	3,458 11,730	4,689	.99919	6	-(74.53)	44	-(109.36)
27	13,049	11,200	--	--	.99919	54	99.77	42	99.77
32	13,864	13,094	--	--	.99838	60	46.13	37	46.13
39	10,948	15,274	--	--	.99643	120	-(517.27)	30	-(517.27)
49	13,706	17,910	--	--	.99085	120	-(499.86)	20	-(499.86)
59	19,675	16,348	--	--	.97773	120	390.45	10	390.45
68	13,307	14,153	--	--	.94954	72	-(57.84)	1	-(57.84)
					Social Rates of Return:		< 0		< 0

TABLE 178

SOCIAL RATE OF RETURN CALCULATIONS

SANTA CATARINA - MEDICINE GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.34)	50	-(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	15,967 45,053	4,700	.99971	36	-(688.91)	46	-(1,735.70)
27	--	11,200	15,967 45,053	4,689	.99919	36	-(808.55)	43	-(1,854.80)
29	33,436	11,200	--	--	.99919	24	533.23	40	533.23
32	46,799	43,094	--	--	.99838	60	2,019.02	37	2,019.02
39	39,884	15,274	--	--	.99643	120	2,942.66	30	2,942.66
49	45,764	17,910	--	--	.99085	120	3,311.90	20	3,311.90
59	29,946	16,348	--	--	.97773	120	1,595.42	10	1,595.42
68	36,201	14,153	--	--	.94954	72	1,507.39	1	1,507.35
					Social Rates of Return:		13.98		6.73

TABLE 179

SOCIAL RATE OF RETURN CALCULATIONS
SANTA CATARINA - PHARMACY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	(13.34)	50	-(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	13,039 28,516	4,700	.99971	36	-(583.53)	46	-(1,140.55)
25	--	11,200	13,039 28,516	4,689	.99919	6	-(117.20)	44	-(209.98)
27	14,120	11,200	--	--	.99919	54	157.55	42	157.55
32	15,922	13,094	--	--	.99838	60	169.41	37	169.41
39	18,927	15,274	--	--	.99643	120	434.35	30	434.35
49	19,836	17,910	--	--	.99085	120	229.01	20	229.01
59	22,913	16,348	--	--	.97773	120	770.26	10	770.26
68	22,913	14,153	--	--	.94954	72	598.89	1	598.89
						Social Rates of Return:	4.40		1.80

TABLE 180

SOCIAL RATE OF RETURN CALCULATIONS

SANTA CATARINA - DENTISTRY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.34)	50	-(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	8,210 21,285	4,700	.99971	36	-(409.74)	46	-(880.30)
25	--	11,200	8,210 21,285	4,689	.99919	12	-(176.51)	44	-(333.28)
27	13,710	11,200	--	--	.99919	48	120.38	42	120.38
32	20,334	13,094	--	--	.99838	60	433.70	37	433.70
39	22,929	15,274	--	--	.99643	120	915.32	30	915.32
49	24,052	17,910	--	--	.99085	120	730.30	20	730.30
59	20,610	16,348	--	--	.97773	120	500.05	10	500.05
68	16,134	14,153	--	--	.94954	72	135.43	1	135.43
					Social Rates of Return:		8.42		4.08

TABLE 181

SOCIAL RATE OF RETURN CALCULATIONS

SANTA CATARINA - ENGINEERING GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.34)	50	-(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	(76.18)
23	--	7,875	9,441 26,786	4,700	.99971	36	-(450.04)	46	-(1,078.28)
26	--	11,200	9,441 26,786	4,689	.99919	24	-(382.54)	43	-(798.48)
28	26,319	11,200	--		.99919	36	543.84	41	543.84
32	26,034	13,094	--		.99838	60	775.14	37	775.14
39	40,833	15,274	--		.99643	120	3,056.13	30	3,056.13
49	24,337	17,910	--		.99085	120	764.18	20	764.18
59	27,768	16,348	--		.97773	120	1,339.88	10	1,339.88
68	20,435	14,153	--		.94954	72	429.48	1	429.48
					Social Rates of Return:		15.28		8.14

TABLE 182

SOCIAL RATE OF RETURN CALCULATIONS
SANTA CATARINA - LAW GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.34)	50	-(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	1,916 5,385	4,700	.99971	36	-(183.22)	46	-(308.07)
26	--	11,200	1,916 5,385	4,689	.99919	24	-(202.08)	43	-(285.27)
28	22,817	11,200	--	--	.99919	36	417.87	41	417.87
32	28,507	13,094	--	--	.99838	60	923.38	37	923.28
39	27,862	15,274	--	--	.99643	120	1,505.17	30	1,505.17
49	38,011	17,910	--	--	.99085	120	2,390.05	20	2,390.05
59	19,895	16,348	--	--	.97773	120	416.16	10	416.16
68	70,473	14,153	--	--	.94954	72	3,850.42	1	3,850.42
						Social Rates of Return:	20.37		16.38

TABLE 183

SOCIAL RATE OF RETURN CALCULATIONS
SANTA CATARINA - AGRONOMY GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.34)	50	-(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	16,499 38,114	4,700	.99971	36	-(708.06)	46	-(1,485.97)
25	--	11,200	16,499 38,114	4,689	.99919	12	-(275.90)	44	-(535.07)
27	37,827	11,200	--	--	.99919	48	1,277.06	42	1,277.06
32	37,409	13,094	--	--	.99838	60	1,456.54	37	1,456.54
39	7,101	15,274	--	--	.99643	120	-(977.26)	30	-(977.26)
49	35,606	17,910	--	--	.99085	120	2,104.09	20	2,104.09
59	30,916	16,348	--	--	.97773	120	1,709.23	10	1,709.23
*68	30,916	14,153	--	--	.94954	72	1,146.03	1	1,146.03
*Estimated				Social Rates of Return:			16.22		6.74

TABLE 184

SOCIAL RATE OF RETURN CALCULATIONS

SANTA CATARINA - ECONOMIC AND POLITICAL SCIENCE GRADUATES

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.34)	50	-(13.34)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	5,267 9,403	4,700	.99971	36	-(303.82)	46	-(452.68)
25	--	11,200	5,267 9,403	4,689	.99919	12	-(141.22)	44	-(190.81)
27	16,134	11,200	--	--	.99919	48	236.64	42	236.64
32	17,938	13,094	--	--	.99838	60	290.17	37	290.17
39	24,406	15,274	--	--	.99643	120	1,091.93	30	1,091.93
49	36,447	17,910	--	--	.99085	120	2,204.09	20	2,204.09
59	10,954	16,348	--	--	.97773	120	632.87	10	632.87
68	15,000	14,153	--	--	.94954	72	57.91	1	57.91
					Social Rates of Return:		12.40		10.06

TABLE 185

SOCIAL RATE OF RETURN CALCULATIONS

SANTA CATARINA - "OTHER" COURSES COMPLETED

Age Midpt.	Gross Inc. Per Mo.	Secondary Inc./Mo.	University Cost/Mo.	Student Inc./Mo.	Mortality	Months in Period	Flow/Period W/O Capital Cost Cr$ x 1,000	Yrs. to End	Flow/Period With Capital Costs Cr$ x 1,000
19	--	5,256	--	4,700	------	24	-(13.36)	50	-(13.36)
21	--	7,875	--	4,700	.99971	24	-(76.18)	48	-(76.18)
23	--	7,875	7,594 20,937	4,700	.99971	36	-(387.57)	46	-(867.78)
25	--	11,200	7,594 20,937	4,689	.99919	12	-(169.12)	44	-(329.11)
27	23,804	11,200	--	--	.99919	48	604.50	42	604.50
32	27,241	13,094	--	--	.99838	60	847.44	37	847.44
39	20,978	15,274	--	--	.99643	120	682.03	30	682.04
49	28,606	17.910	--	--	.99085	120	1,271.78	20	1,271.78
59	16,264	16,348	--	--	.97773	120	-(9.86)	10	-(9.86)
68	26,388	14,153	--	--	.94954	72	836.47	1	836.47
					Social Rates of Return:		16.18		8.06

APPENDIX III

INTERVIEWS

INTERVIEWS HELD IN CONNECTION WITH THE STUDY

The following persons were interviewed at various times during 1967 and 1968 concerning the census and the accuracy of results obtained using census data:

Dr. Sebastião de Oliveira Reis, Director-Geral, Serviço Nacional de Recenseamento, Rio de Janeiro.

Amaro da Costa Monteiro, Director Técnica, Serviço Nacional de Recenseamento, Rio de Janeiro.

Osmar Araujo dos Santos, Chefe, Serviço de Programação, Serviço, Nacional de Recenseamento, Rio de Janeiro.

Hélio Hemetério dos Santos, Chefe, Secção do Censo Demográfico, Serviço Nacional de Recenseamento, Rio de Janeiro.

F. Romero Freire, Chefe, Serviço de Operação de Computadores Electrônicos, Serviço Nacional de Recenseamento, Rio de Janeiro.

Dr. Rubens D'Almada Horta Pôrto, Membro, Commissão Censitária Nacional; and Chefe, Serviço de Estatística Demográfica, Moral e Política, Rio de Janeiro.

Américo Gomes do Amaral, Inspetor Regional, IBGE, Florianôpolis, Santa Catarina.

Domrimy M. Freitas, Auxçiliar de Estatística, IBGE, Florianôpolis, Santa Catarina.

Floriano Leão da Costa, Inspetor Regional, IBGE, Belém, Pará.

João Álvaro Lima, Chefe das Relações Públicas, IBGE, Belém, Pará.

José Nazaré Pontes de Sourza, Inspetor Regional, IBGE, Manaus, Amazonas.

Dr. Issac Kerstenetsky, Diretor, Instituto Brasileiro de Economia, Fundação Getúlio Vargas, Rio de Janeiro.

Merton V. Lindquist, Bureau of the Census (U.S.), working with IBGE through USAID program, Rio de Janeiro.

Arnold King, Bureau of the Census (U.S.), working with IBGE through USAID program, Rio de Janeiro.