CROSS-SECTION ANALYSIS OF DEMAND FOR HOUSING IN VENEZUELA

Thesis for the Degree of Ph. D. MICHIGAN STATE UNIVERSITY EMIL OTTO HERBOLZHEIMER 1972



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Emil Otto Herbolzheimer

Despite the proliferation of literature on housing in Latin America in recent years, very little work has been done at the analytical level. Most of the writing has consisted of either descriptions of housing policies and programs or estimates and projections of housing needs and deficits.

This course is understandable. Partly for political and partly for economic reasons, most Latin American governments have only recently shown a genuine interest in solving the housing problem. Moreover, reliable data on housing was simply not available. Finally, even for the most developed nations, rigorous theories of the housing market did not appear until the early 1960s.

Ambitious housing programs, such as those envisioned by the Venezuelan government, require extensive knowledge of the housing market. This knowledge can only be obtained by building a comprehensive housing model which is a very complex task.

The purpose of this study is to contribute to the demand side of the model. The major part of the thesis tests three

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Emil Otto Herbolzheimer

hypotheses that relate a string of socio-economic variables to the demand for housing. Statistically, which are the most significant variables and what are the values of their parameters? Of particular interest is whether housing is a normal, a luxury or an inferior good, i.e., whether the income elasticity of the demand for housing is equal to, more than, or less than one.

There are several by-products in the study which may prove to be of more practical help for the policy-maker. In Chapter IV I determined total and direct (on site) employment oreated by the construction of a housing unit according to type, structural area and location of the housing unit. Chapter II is devoted to a review of the present stock of housing, the nature and growth of the mortgage market, the foreseeable bottlenecks in the construction industry and a critique of land use. Finally, some of the tastes and preferences expressed by heads of households with respect to type, location and expenditure on housing are tabulated.

The econometric model is based on multiple regression equations in four different functional forms. The data is cross-sectional and was drawn from four different sources. Three of these were household surveys taken during 1967 and 1970 in urban areas. The main portion of the analysis is based on one survey which covered nearly 90,000 households in 86 cities throughout Venezuela. The fourth source of data consisted of information collected from the application forms

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of 3,290 applicants for mortgage loans in 22 savings and loan association offices during 1970.

As expected, the results show that income is by far the most important determinant of the demand for housing. The value of the income elasticity varies drastically, however, depending on the method used to measure income and the income range under consideration. The elasticity is consistently higher for the middle income ranges, when attempts are made to approximate permanent, as compared with current income, or when income is adjusted to reflect downpayments. Holding income constant, the only other consistently significant variable is the level of education. Age of head of household is sometimes important.

The differences among cities are minor as compared with differences among income groups and urban sectors. One factor which becomes apparent is the extent to which the housing market is segmented. Any serious housing analyst should avoid lumping public housing or squatter settlements together with conventional housing. Institutional practices, in particular as they refer to credit terms, also play an important role in the housing market.

Some regressions with low coefficients of determination may serve as a reminder of the complexity of social phenomena and of the inadequacy of data.

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The encouragement received from my wife, Kathy, in times of progress and occasional despair and the time and effort she contributed towards the completion of this study are immeasurable.

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The problem faced by most capitalistic developing nations, and in particular. Latin America, however, is of a different nature. The lack of housing is directly related to the lack of development or lack of balanced growth. The housing problem is only a physical expression of all other ills. The massive and societated construction of new housing units will not solve the problem unless if is coupled with the implementation of programs that are directed towards changes in the structure of the socnosy itself. Torrealba lists four structural factors which are related to the bousing situation cremon to most of Latin

CHAPTER I

INTRODUCTION

Background

Most countries face housing shortages. This problem is shared equally by capitalist and socialist, developed and developing nations, although it differs widely in its intensity and causes.

In most developed countries the housing deficit is basically a physical problem caused by market imperfections, mainly on the supply side. The solution is relatively easy through better financing, an increase in the capacity of the construction sector and cheaper construction methods.

The problem faced by most capitalistic developing nations, and in particular, Latin America, however, is of a different nature. The lack of housing is directly related to the lack of development or lack of balanced growth. The housing problem is only a physical expression of all other ills. The massive and accelerated construction of new housing units will not solve the problem unless it is coupled with the implementation of programs that are directed towards changes in the structure of the economy itself.

Torrealba lists four structural factors which are related to the housing situation common to most of Latin America: [1]⁸

- a) "incompatibility between income levels and cost of housing
 - b) structural limitations in the financing and construction of large number of housing units
- c) the phenomenon of accelerated urbanization
- d) socio-cultural and administrative-political limitations"

Even if considered strictly from the point of view of a quantitative deficit, as is conventionally done, the problem is staggering. The United Nations estimated the housing needs for 1970 in Latin America, including replacement, to be approximately 52 million units, "based on the assumption that 40 percent of the urban population and 50 percent of the rural population now live in bad housing."[2] Despite the rough approximation of this and similar estimates, they nevertheless point at the dramatic situation. To simply keep the deficit stationary under present rates of urbanization and population growth, a group of experts estimated that Latin America would need to build 10 units per 1,000 inhabitants yearly, which is far above the level of the actual construction capacity and would require 10 percent of the GNP.[3]

^aEach of these points is discussed in Chapter II as they relate to Venezuela.

Until recently the interest of the government and private institutions in housing was very limited. Central mortgage banks had been formed in a few countries mainly to pacify, by their sporadic action, social and political pressures. It was only after the mid-1950s that housing began to receive the attention it deserved through the creation of national housing institutes and savings and loan associations. Some countries went so far as to create ministries of housing. More recently, housing construction has been spurred by foreign credit mainly from AID. These loans usually included clauses stipulating matching funds from local sources. The main approach used by national governments in increasing the supply of housing has been through direct construction and the provision of incentives to the private sector in the form of tax exemptions and guarantees.

Despite all of these efforts, the housing deficit has increased and many programs have failed. Part of the problem stems from the "low capacity resulting from shortage of domestic capital and the characteristic bureaucratization and political interference by which the institutions are often trammeled."[4]. In addition, all too often the primary reason for establishing housing programs was political or social rather than economic. It is not surprising that one of President Caldera's main points in his 1968 campaign platform was "100,000 housing units per year," which only materialized in 40,000 the ensuing year.[5] Or that among the

various reasons given for building the famous high-rise low-cost apartments in the 1950s a highly plausible one was that "the image-conscious dictator thought that their <u>ranchos</u> spoiled the new look of the capital...so he bulldozed them off their sites."[6]

Purpose of the Study

A better knowledge of the housing market was needed for the new programs and policies. Thus, research on housing began in some countries. A vast amount of literature covering many aspects of housing in Latin America has emerged. These writings are basically descriptive. They review and define housing policies and projects. Most of the statistical work limits itself to cross-tabulation analysis from survey information on housing stock or potential demand for housing.[7]

A comprehensive study of the housing market, however, entails analyzing all the economic, demographic and physical factors that determine the supply and demand of housing units. If one examines present stock only, all he derives is deficit estimates. A dynamic analysis requires making projections on the shifts of the demand and supply curves. This is a very complex task.

The purpose of this study is to partially contribute to this task by studying the demand for housing in Venezuela. The question I attempt to answer is: What determines the amount that households are willing to spend on housing and what are the characteristics of this demand? The response

will be obtained through means of an econometric model that will determine and weigh the main socio-economic variables that affect housing consumption.

The study will be directed towards testing the following hypotheses:

- a) Housing is a normal good, i.e., the elasticity of income with respect to expenditure on housing is close to one;
- b) Urban size and sector, age, sex and downpayment are the most important determinants of housing demand, other than income; and
 - c) All other socio-economic variables are not statistically significant.

The large sample of data and the diversity of information available would have allowed for a more comprehensive study of housing demand, such as potential demand estimates and stratified demand projections. Part of the analysis will touch on these points, in particular, in relation to expressed housing preferences. The remainder will be left for further work.

With the results obtained in Chapter IV on new mortgagors, I will determine total and direct (on site) employment created by the construction of a housing unit according to type, structural area and location of the house.

 $\ensuremath{^{b}\textsc{The}}$ rationale for these hypotheses is given in Chapter III.

Statistical Sources

Four sources of data were used in the analysis. Except for the savings and loan associations' data, all the rest stem from household surveys undertaken in Venezuelan urban areas between 1967 and 1970. Since some of the information overlaps I can test with different data to compare the results and test their consistency. Surprisingly, the abundance of data on housing has not prompted other researchers to utilize it more extensively. The sources are:

I. MERCAVI (study of real demand for housing)

In an effort to quantify and qualify the real and potential demand for housing in Venezuela, the National Housing Committee undertook a housing survey during 1970, unprecedented in scope and size. The need to obtain reliable information became imperative because of the proliferation of qualitative and quantitative, but inconsistent housing deficit estimates used at public and private policy levels. Most of these estimates were based on either projections or small sample surveys.

The sample of MERCAVI's survey covered all cities (86 total) in the country above 10,000 inhabitants. Included were 65 percent of the total population. Nearly 90,000 households were interviewed, stratified by city and type of residential area. The questionnaire consisted of four parts (see Appendix D-1):

1) The physical and economic characteristics of the housing unit,

- 2) Family composition and income.
- 3) Opinion expressed by head of household on tastes and preferences.
- 4) Migration history of head of household.

The information used in the analysis is drawn basically from parts two and three. after a series of transformations. One noteworthy element in the questionnaire is the distinction made between principal and additional households. This distinction reflects the prevalence of the extended family over the nuclear family in Venezuela. Furthermore, households often include persons who are not members of the extended family. A principal household is classified as a group of people, related or not, who lead a common life under the same roof. If within this group there are some members who would prefer to live separately and express a desire to move as soon as the impediments disappear, this group will be considered an additional household. Thus, there may be one principal and three additional households in the same dwelling. Apart from the first section of the questionnaire that relates to the physical aspects of the house, each household is treated separately in the survey. This distinction is particularly important in establishing potential demand, and a also because a household with several members who feel their stay is only temporary may have different expenditure patterns.

The survey was satisfactory in general, although some questions could have been improved had the analytical outline been developed before the questionnaire. II. NATIONAL SAVINGS AND LOAN ASSOCIATION BANK (B.N.A.P.)

Established in 1961, the savings and loan system in Venezuela has experienced a spectacular growth. By 1970 there were 22 branches in the country and membership had risen to 55,000. These branches are spread across the nation and are under the jurisdiction of the National Savings and Loan Bank which guarantees the loans and savings. In 1970 the National Bank began to build a data bank for its own research purposes. The punched cards that were stored contained information related to the financial terms of the loan, physical characteristics of the house and family characteristics of the applicants. Since I felt that the analysis would be enriched by obtaining more information available in the application forms, I collected additional data on: sex, age, and profession of the family head, as well as tenure and expenditure on the dwelling occupied at the time of application (see Appendix D-2). Only accepted applications were included in the sample of 3,290 corresponding to 1970.

This set of data is without doubt the most reliable of that used in the study, as the information provided in the forms is based on documentation required by the institutions for the loan agreements.

III. UNIVERSITY OF CARABOBO (U.C.)

In 1969 the University of Carabobo in Valencia, in cooperation with the Central Bank, took a survey in Valencia

and vicinity for the elaboration of a cost of living index. The family budget was divided into: a) food, b) clothing, c) housing, utilities and household goods, and d) others. In addition, information was gathered on income and family characteristics. Only the data related to housing (c) were used in the analysis (see Appendix D-3).

An initial sample was drawn which consisted of 1,500 households. Information was gathered about the families' expenditures on a daily basis during one month. From this sample 423 were chosen, on a stratified basis and on the willingness to cooperate, for the final sample. These selected families were interviewed again for another month. In my study I use the data on the final sample.

Some doubts arise as to the accuracy of reported housing expenditure and income. Even though the consistency of the replies was checked by posing the same question in both surveys, it is only with respect to actual rent paid that consistent answers were obtained. In case of ownership, if the mortgage, if any, had been paid up, the head of the family was asked to assess what would be the amount for which he could rent the dwelling. His estimate was used as the imputed rent value and added to the family income. Most likely these imputed rents will suffer from inflation. When the head was unable to reply, the interviewer imputed the rent directly by applying 1 percent per month of the house value.

IV. CORPORACION VENEZOLANA DE GUAYANA (C.V.G.)

The Corporacion Venezolana de Guayana is a governmental agency responsible for the urban and industrial planification of Ciudad Guayana. Planning is difficult without up-to-date data on the economic and demographic characteristics of the population living in the city.

In order to collect this data, C.V.G. began taking a series of surveys in 1967. These surveys are being taken continuously, every four months, at the household level. In addition to information on household characteristics and employment, the survey also collects data on income and budget expenditure as well as on housing (see Appendix D-4). Similar to the survey by the University of Carabobo, the households selected are interviewed on a daily basis about their daily expenses during one month. The main difference is that in the C.V.G. survey one of the household groups, a control unit, is interviewed every four months to allow for seasonal fluctuations.

The initial sample, drawn on a 1/20 scale of all housing units in Ciudad Guayana, consisted of 940 households. These were stratified into four sectors:

- 105 (1) residential, urban ratio to be reversed in the period
- 2) downtown (old town),
- 3) transitional (that sector which is in a stage of progressive improvement either by public or private initiative),
- 4) squatter settlements.

The final sample used in my analysis, randomly chosen, consisted of 319 households. About one fourth of the sample consists of control units. The information on income and budget expenditures of these control households is based on the average of three interviews (in one year).

Unfortunately, all the repeated attempts at obtaining data from private mortgage banks were futile. These banks cater basically to high-income groups.

It is interesting to note that some of the questions in these surveys were careful in reflecting the peculiarities of Venezuela, such as: "Is the land owned or was it taken by force?", "Are you married or kept?", "Was the dwelling purchased, built by others or by yourself?"

Data and Chapter Arrangement

The study is limited to urban areas greater than 10,000 inhabitants. The urban areas merit special attention because of the rapid urbanization of Venezuela during the past 40 years. During the last decade alone, while total population grew at an average rate of 3.5 percent per year, that of urban areas was double this rate. This rapid transition has caused the rural-urban ratio to be reversed in the period 1920-1969. [8] Since this trend is not expected to change in the near future, where the housing problem will remain critical is in the cities. In addition, no survey similar to those available of cities had been taken of rural areas. Rapid urbanization was not restricted to the capital but has affected cities of all sizes throughout the country. Given the difference in economic activities, politicoadministrative position, migration trends and topography, the impact of such a rapid growth in terms of housing, differed widely between cities. Furthermore, the values and attitudes of families towards housing are influenced by their urban experience, how permanently they view their residence, by land accessibility, income levels and others. To test for these differences, four cities were chosen as case studies all of which have experienced rapid growth:

- <u>Caracas</u> 2 million inhabitants, narrow valley, capital of the nation, modern, main activity in services, large concentration of high income, intense sporadic immigration.
- Valencia 300,000 inhabitants, wide valley, old colonial city, traditional, main center of industrial growth when import-substitution (light industries) impulse began in late '50s, gradual absorption of immigrants.
- 3. <u>Barquisimeto</u> 350,000 inhabitants, no space <u>limitations</u>, rural outlook, regional center of cattle and farming country, little industry, basically services, heavy steady immigration.
- 4. <u>Cludad Guayana</u> 150,000 inhabitants, no space limitations, new city formed in 1960 as growth pole, heavy industry and mining, no politicoadministrative center, modern, largest immigration rates in the nation.

The Venezuelan government has focused much attention on Ciudad Guayana as an experiment in economic decentralization. Housing has, however, been one of the major problems in that city. Since other Latin American countries may try to follow the example if it succeeds, it was felt that this case deserves special attention.

The character of housing problems differs sharply between social groups. Any housing program needs to recognize these differences and in turn apply alternative approaches. Income seems to be the best social group index since it incorporates many other non-quantifiable variables. In the analysis the sample is divided frequently into high, middle and low income groups or urban sectors.

Unlike some authors who believe that the need is for a policy that would "stimulate low-cost housing directed to the popular groups, and depress luxury housing," [9] I feel that one should not exclude the other. If the capacity of the construction industry suffices, both should be stimulated since both have important economic effects. For this reason I am concerned with all income groups in this study.

The housing needs of the high income class have been regularly satisfied, as traditionally the market funds that went into housing tended to be associated with luxury construction for the upper classes. The high-middle and the middle income groups have been slowly incorporated into the housing market as well. Their savings potential began to be tapped by the new mortgage banks and savings and loan institutions which offer easier credit terms on mortgage loans.

With regard to the urban low-income groups, however, the problem is basically one of economic, social and political

"marginalization."^C The housing provided to them has come from direct government intervention or self-construction. Their housing problem demands non-conventional and innovative solutions. Furthermore, the family, employment and expenditure characteristics of low-income groups (in particular, expenditure on housing) seem erratic and diversified. Previous surveys have found it difficult to obtain honest and consistent responses, particularly on income.[10]

For these reasons, I pay special attention in this study to the households living in squatter settlements. In Appendix A of Chapter V, I describe how squatter settlements are formed and their significance in the urbanizing process of cities. The division of the survey samples by certain sectors enables us to separate this group. By comparing the results of this group with that of the others, the differences will be ascertained and tested. Not all low-income people live in such squatter settlements nor do all the people living in those areas have low income. Yet, there is generally a direct correlation between low income and living in squatter settlements.

There are some problems in defining households and measuring incomes and expenditures in Venezuela. The surveys have, in general, tried to take this into consideration, yet

^CMarginalization as applied here, and in most of Latin American literature, refers to that economic process whereby a segment of the population (marginal population) is kept outside the realm of organized society.

there are still measurement errors. This is one of the reasons I am performing the same regressions for two cities with different data sources. Significant differences in the results will cast some doubt on the reliability of the data. Some further data adjustments will be discussed in Chapter III when the model is developed.

Chapter II briefly describes the political, social, and economic situation in Venezuela and reviews the housing situation and related aspects. The choice of variables, the application of the model and the interpretation of the results require a full preliminary understanding of the country, and its housing problems.

The model presented in Chapter III is tested with data on mortgagors of new housing in Chapter IV, and renters and all mortgagors in Chapter V. The results are discussed in the last chapter (conclusion and summary).

Review of Literature on Housing in Venezuela

As mentioned above, during the past decade much literature on housing has appeared in Latin America, including Venezuela. Most of this literature stems from papers presented in conventions and seminars. They relate to housing policies [11] and needs [12], housing financing [13] and mobilization of savings [14], judicial structure of housing [15] or squatter settlements [16]. A large variety of statistics have also been obtained from censuses, publications of construction magazines and surveys such as those of the Banco

Obrero and Banco Central. The most important survey was that prepared by a committee appointed by presidential decree in 1964. The committee's recommendations were applied, in part, in the 1965-1968 National Housing Plan.[17] Only a few of all these writings, however, have added insight into an analysis of the housing market.

In a study of housing in Caracas, Carlos Acedo Mendoza [18] reviews the major factors which have caused a deterioration of housing conditions. These include the price of land and speculation, mal-distribution of income, intensive immigration and inadequate supply of funds for housing. He proceeds to study the circumstances which have led to a relative increase of the population living in squatter settlements, and arrives at the same conclusion which has been postulated above: the housing problem is twofold. He made a clear distinction between marginal and non-marginal population, and stressed the need for different solutions to the two groups' housing problems.

An evaluation of living conditions in the governmentbuilt high-rise apartments indicated how the project failed because it did not recognize the complexity of the problem. [19] Eradicating squatter settlers and placing them in vertical slums is not the solution.

Reverting the attention to high-income groups, a sociology student, in 1968, wrote a thesis on the characteristics of the mortgage loans of the largest mortgage bank in Caracas. [20]
Using a sample of 510 successful applications, she looks into the purpose of the loan, the residential choice, mobility patterns of the applicants and their socio-economic characteristics. Furthermore, she makes a cross-tabulation analysis on the relation between income and loan, income and monthly payments and distribution by age and number of family members. Since our study does not include data on mortgage banks, these results will prove helpful in completing the analysis of housing demand.

A much broader study of the mortgage market in Venezuela was that undertaken by the Central Bank in cooperation with AID. [21] Based on two surveys taken in the fourth quarter of 1962 and during 1957, it tries to establish a measure of the mortgage market characteristics. It determines certain aspects of the mortgages processed, the volume of the market and, finally, its distribution. The findings are basic in understanding the present housing situation. The summary states,

"Up until 1962, the mortgage market in Venezuela was characterized by a predominant number of shortterm (1 to 3 years), high interest (12 percent annual) loans which did not provide for the amortization of the principal in fixed periodical payments. The principal suppliers of capital for the mortgage market have been private investors."

A more recent study, URVEN, [22] showed that despite the increase in mortgage funds between 1962 and 1965, noninstitutionalized mortgage loans, made by private investors, still represented 70 percent of the total.

URVEN is the most comprehensive analysis of urbanization done in Venezuela. Volume V is directly concerned with

housing. This study provides not only the best summary of such housing aspects as financing and housing services, but it also makes the first attempt at calculating what are the specific credit terms the financial institutions should provide to the different income groups according to living areas. The living areas were divided into urban, intermediate and rural. Using data from the Commission on Urban Development and Housing, they correlated the income distribution of the total population with housing expenditure and derived the following functions:

				-0.00428X	
a)	urban	Y=95	(l-e)	X=monthly
ъ)	intermediate	Y-9 6	(l-e	-0.01073X)	payment
c)	rural	¥=98	(l-e)	Y=percent accumulated of population according to income

Applying these coefficients, the paying capacity for housing of each income group can be determined. The percentage of income spent on housing varies between income groups and areas from 11.25 percent and 25 percent. Although interesting in its appraoch, the study stops short of what it could have accomplished.

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has been widespread. Yes despite the fact that the majority of the population has soved upward. It did in such a way that their relative ranking has absord your little." [1]

The blessings of the CHAPTER II was sired. Serious saled-

HOUSING AND HELATED FACTORS IN VENEZUELA

General Overview

Few countries have changed as much as Venezuela has over the past 45 years. Change began with the discovery of oil. Oil soon displaced cocca and coffee as the country's main export, and led the country into an almost uninterrupted process of economic growth. By the 1960s Venezuela had become the main oil exporter in the world. Rapid growth affected society at all levels.

Economically, Venezuela has risen from one of the most backward positions in Latin America to the leading one in terms of per capita income and monetary stability. Politically, the traditional pattern of civil power subordinated to military force and prestige has been finally reversed. Since 1959, the country has enjoyed the first three consecutive presidential terms through peaceful elections.

Change was not limited to a few social groups. From colonial times, Venezuelan society lacked the rigid social stratification so prevalent in other Spanish colonies. Economic growth and good communication networks have further facilitated social mobility.

but contributed 29 percent 21 the GMP. (2)

"It is evident that in all groups horizontal mobility has been widespread. Yet despite the fact that the majority of the population has moved upward, it did in such a way that their relative ranking has changed very little." [1]

The blessings of rapid growth were mixed. Serious maladjustments developed which were enhanced by the dualistic nature of the production sector.^a This dualism was reflected in the distribution of income and, in particular, in rapid urbanization, perhaps the most important phenomenon of the past 45 years.

Urbanization

Until the 1920s, Venezuelan population remained relatively stable. Since then, coinciding with rapid economic growth, it has quadrupled. The population concentrated in urban areas. By 1970, 66.5 percent of the total population was living in areas above 5,000 inhabitants. [3] Rural population remained almost steady. [4]

Caracas, the capital, was affected, but so were cities of all sizes. It is interesting to note that migration occurs in stages, so that rural emigrants do not go directly to the largest cities, but pass through the neighboring urban centers first. Caracas receives practically no direct migrants. [5]

Despite this rate of urbanization, urban planning was passive and with the exception of those areas where government

^aDuring the period of fastest economic growth, 1948-58, traditional agriculture, while employing 31 percent of the nation's active population, contributed only 3 percent of the GNP. Petroleum employed only 2 percent of the working force but contributed 29 percent of the GNP. [2]

invested directly, such as the Banco Obrero or Centro Simon Bolivar, the cities' growth has been anarchic. [6] The situation has been particularly critical in the area of housing. The few regulatory plans developed were not implemented, either because the municipalities lacked the funds and administrative capacity, or because they did not agree with the centralized planning agency. [7] An exception has been the urban planning agency of the Federal District set up in 1964. This agency unfortunately has jurisdiction over only half of the city of Caracas.

Since urbanization has preceeded sufficient industrialization, rates of unemployment and underemployment have been high. Large segments of the population are forced to live outside the realm of the market society, including the housing market.

Housing Conditions

Several groups have tried to assess the housing conditions by determining absolute housing "needs" or "deficits". They commonly showed enormous deficits.^b All of these estimates suffer from the pitfalls of subjective normative standards as to what constitutes an acceptable housing unit or overcrowding. Most of the standards are adopted from advanced

^DThe most widely used estimate by politicians, newspapers and professionals is 800,000 units by the late sixties. This figure probably stems from a study by the Ministerio de Fomento which showed a deficit of 694,000 by 1961 [8] In that year there were 1,462,000 housing units in the country of which 511,000 were slum squatters.

countries and often have little relevance with the economic, social or cultural patterns of Venezuela.

The most important bias in the derived estimates is the persistent failure to include some of the squatter settlements as part of the housing stock. This becomes apparent in the study made by the Banco Obrero of the change in housing stock between the National Census of 1961 and its survey of 1967. Using standards more in line with Venezuela's needs, the study shows that of all new "acceptable" housing additions, in a sample of nine cities, 67 percent consisted of either new or improved "ranchos". [9]

Of all the housing deficit estimates the most reliable and relevant to this study are those of MERCAVI. The definition of total deficit used is the weighted sum of the qualitative, quantitative, technical and hygenic deficits. The results indicate that 23 percent of all families in cities above 10,000 inhabitants either live in inadequate housing or lack housing. More relevant than the numbers themselves is the distribution of this deficit. Of those families who needed housing, 44.7 percent had incomes below Bs.500 per month and 81.5 percent below Bs.1000 per month. Only 6.1 percent were in the income brackets above Bs.1,500 per month [10] (4.5 Bolivares = \$1.00). These results are quite consistent with those of URVEN in 1965, which estimated that only 11 percent of those families with income above Bs.1.300 needed housing. [11]. As has been shown, the housing problem is to a large extent one of income, but other structural factors

make it difficult for large segments of the population, who could otherwise afford housing to satisfy their needs. These factors are: the structure of the financial mortgage markets, the capacity and productivity of the construction industry and the allocation of land. They are analyzed in the rest of the chapter.

Financial Mortgage Markets

According to a study by the Interamerican World Bank, writing in 1968, "In Venezuela, contrary to other Latin American countries. there exists a vigorous and growing mortgage market, basically due to the nation's monetary stability." [12] This statement refers to recent developments. Mortgage loans have traditionally been the favored form of investment by private investors. The contact between lender and borrower was direct (non-institutional), and this was the mortgage market operation par excellence. Commercial banks also channeled a considerable amount of funds into the mortgage market. By law, they operate on a short-term basis. Thus, until the end of the decade of the 1950s, long term mortgage loans were rare, with the exception of those made by insurance companies. They were the first lenders to introduce loans on a monthly amortization basis and for maturity periods between 5 to 10 years. [13]

Moreover, only a small portion of these mortgage loans was actually used for the purchase or construction of buildings, the reason being that the mortgage market served as a substitute

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for the stock exchange. The few large local companies were usually closed and used internal resources for investment. There was also a general lack of confidence among investors in the stock market. Its legal provisions were limited, in particular as it relates to the rights of small investors.

A study by the Banco Central of the mortgages registered by 1957 summarizes the market characteristics [14]:

- a) 76 percent of all loans had maturity periods of less than three years
- b) 82 percent of the documents do not contemplate periodic amortization payments
- c) nominal interest rates ranged mainly from 11 to 12 percent
- d) only 19 percent of the loans were specified as being for the purchase or construction of buildings.

Given these financial terms, mortgage loans were out of reach for lower income and most of the middle income groups who wanted to buy a house. The government tried to solve, in part, the problem by creating the Banco Obrero in 1928, which built homes and provided loans to the working class. Yet, the government soon realized the bank's financial limitations. In 1957, in an effort to form a more organized and specialized mortgage market directed towards housing, it passed a law creating the mortgage banks.

It was not until the mid-1960s, however, that the housing mortgage market began to gain momentum. There are two main reasons for this development: [15]

a) The substantial change undergone by the Venezuelan economy:

When the external sector no longer provided the necessary stimulus for economic development, it was replaced by the import substitution industry as the leading sector. The growth of such industries required an effective mobilization of internal resources. These new demands for funds led to a remarkable development of the country's financial structure. The existing financial institutions have adapted to the new demands and new ones have been created.

b) The monetary and financial, as well as political stability the country has experienced during the 1960s:

> Private financial institutions flourish only in an atmosphere of confidence. This confidence was provided by the general stability of Venezuela during the last 13 years.

Table II-1 indicates the growth (net flow) of the housing mortgage market since 1962. [16]

Some important trends are shown in Table II-1. Institutional lenders have steadily increased their share in the mortgage market from 33 percent in 1962 to 49 percent in 1970. The Table also shows the decline in the relative importance of the insurance companies and commercial banks which were so important before. These trends also hold true for the nonhousing mortgage market. [17] The share of these mortgages placed in Caracas has not changed and still constitutes two-thirds of the total of the nation. [18]

With respect to amortization, there has been a steady lengthening of the periods, as shown in Table II-2. [19]

Longer amortization periods have been coupled with increases in the money interest rates. This is consistent with monetary theory (see Table II-3). [20] It should be stressed,

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Mortgage Loans for the Purchase of Structures by Financial Institutions

				In	is tituti onal	l Mortgages						
			Public				Prlvat	e				
Ycar	Non-Insti- tutional Mortgages	Banco Obrero	Other	Sub- Total	Counterc. Bank	Mortpa ge Banks	Insurance Companies	SavIngs and Loan Assoc.	Other	Sub- Total	Total Institu- tional	Total
1962	284	17	28	45	10	85	ŗ		9	96	141	425
1963	143	37	37	74	13	98	-17	16	10	120.	194	337
1964	202	20	111	131	2	141	6-	98	7	231	362	564
1965	411	-5	94	89	19	158	28	110	2	317	406	817
1966	447	132	16	223	-4	54	11	55	31	187	410	857
1967	343	68	114	182	33	82	17	61	22	203	385	728
1968	569	-20	57	37	ł	239	10	11	40	366	403	972
1969	607	-44	50	ę	7	235	12	223	6	486	492	1.099
1970	864	105	59	164	-34	386	20	306	7	685	849	1.713

TABLE	II- 2
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Year	Am l	ortizati 2	on Period 3-5	(Years) 6-10	10	Without Period
1959	45.7	19.4	7.3	3.1	1.8	22.6
1961	39.7	23.5	11.0	5.2	4.8	15.8
1963	30.1	16.8	8.8	20.7	6.3	16.7
1965	22.5	17.2	16.4	17.3	16.0	10.5
1968	29.1	4.0	8.2	16.4	20.1	22.0

Percentage Distribution of Urban Mortgages According to Amortization Periods Between 1959 and 1968

however, that in aggregate terms the money interest rates may have declined, since non-institutional lenders, which are not included in the Table, have a shrinking share of the market.

TABLE II-3

Average Aggregate Mortgage Loan Interest Rates

	1960	1962	1964	1966	1968	1970
Interest rate	8.9	8.9	9.4	9.5	9.8	10.4

These lenders do not comply with official interest rate ceilings as they escape legal controls.

In order to assess the real cost of money to the borrower, it is more meaningful to look at effective rather than nominal interest rates. The following table indicates the importance of commissions, insurance fees and other requirements stipulated in contracts as of 1967. [21]

TABLE II-4

Institution	Nominal Interest Rate	Effective Interest Rate
Savings and loan association	7	8-11
Banco Obrero	8	9-10
Mortgage and commercial banks	11	14-16
Insurance companies	11-12	15+
Private lenders	12	18+

Nominal and Effective Interest Rates by Mortgage Lending Institutions in 1967

Institutions Geared to Housing

As these institutions grew in number and size, it became apparent that there was a need to consolidate their activities. The government decided to adopt a national housing policy in its National Plan of 1965-68 which was extended, with minor modifications, into the 1970-74 Plan. High income groups would continue to use the mortgage banks and other private institutions for their home financing, and for the high-middle and middle income, the savings and loan associations. The public institutions in turn would reduce the scope of their activities and concentrate solely on the low income groups under Bs.1,200 per month. Within that group, Banco Obrero would be responsible for the cities above 25,000 inhabitants, the Foundation for Community Development for cities between 10,000 and 25,000 inhabitants, and Vivenda Rural for areas below this size.

I describe next the activities, scope and policies of these institutions (public, mixed, and private) which are likely to be most influential in Venezuela's future housing expansion.

I. BANCO OBRERO (public)

The Banco Obrero (Working Class Bank) has been the agency through which the government has operated its housing programs in the cities since 1928. The basic objectives of the bank have been to build low cost housing and to offer mortgage loans to the working class. Until 1953 its construction activities were very limited (it built more units in 1968 alone than from 1928 to 1953). That year (1953) it began the internationally renowned "superbloques" program which it has continued building up to the present. Since then, it has also intensified other housing programs and begun new ones (see Table II-5). [22] Compared

TABLE II-5

Housing Units Built and Mortgage Credits Granted by the Banco Obrero Since 1928

	1928-53	1954-59	1960-65	1966	1967	1968	1969	1970
Built	16,045	25,403	20,487	6,498	11,377	18,767	9,629	15,054
Credits	1,	916 [*]	5,524	891	1,289	1,344	285	95

*For the years 1947-1959 only.

to the direct construction programs, its loan activities have been very modest. The high eligibility requirements for a construction loan may have excluded many potential applicants.^c

The policies and objectives of the Banco Obrero have been redefined several times since 1928. One of the first changes has been to decentralize its activities, which were highly concentrated in Caracas, and spread more into the rest of the country. There has also been the trend to encourage ownership rather than rental of the housing units, as the administration began to realize the psychological stability created by ownership as well as the reduction in maintenance and administrative costs for the Bank. The preference for home ownership expressed by the tenants was an additional consideration. A more recent and far-reaching trend has been towards reducing the direct participation of the Banco Obrero in the construction programs. This change came as a result of the financial limitations faced by the bank and also as a realization that its conventional programs were not reaching the lowest income groups.d

^dMERCAVI's results show that 57 percent of the families living in Banco Obrero units had incomes above Bs.1,500/month and 9.6 percent had incomes above Bs.3,000/month [24]. The law stipulates that the Banco Obrero should build for families below Bs.1,500/month, although it could have been that while

^CThe loans are given for purposes of initiating, expanding or finishing construction. The limit is Bs.30,000 with a 30 year amortization period and an interest rate of 4 percent for the first Bs.15,000 and 6 percent for the balance. The applicants must present construction blueprints and cost breakdown, have a steady income and proof that the land is fully paid for. [23]

This policy change was fully implemented in the 1970-74 working plan, in which 66 percent of the budget will be directed towards non-conventional programs. Altogether the Banco Obrero introduces eight new programs, some of which it had already tried on an experimental basis and others had been adopted by public housing agencies in other countries. One program consists of giving families a piece of land with minimum public services, a loan of up to Bs.2,000 in the form of construction materials, and technical help if needed. In another program, the Banco Obrero purchases and urbanizes a tract of land and gives it to private constructors who build and sell the homes to low-income groups.

The most innovative program, however, is that which is called homes "on slopes". It consists of replacing the rancho which originally stood on the hillsides of Caracas (after proper compensation) with a very simple structure with all the important services. This structure is then sold to the rancho dweller. Its design is such to facilitate subsequent enlargement by the owner himself.

The normal credit conditions of the Banco Obrero in its conventional programs are: amortization period, up to 30 years; interest rate, 4 percent; downpayment, 5 to 10 percent of the house value which shall not exceed Bs.20,000; the share

^d(continued) many families had low incomes when they originally applied, their income has increased since. Contrary to the USA programs, it is not a policy of the Banco Obrero to evict families when their income rises.

of income spent on housing in the rental as well as the ownership units, shall not exceed 15 percent; the income share may be reduced to 10 percent, through subsidy, if the economic conditions of the family are precarious enough. [25]

II. SAVINGS AND LOAN ASSOCIATIONS (mixed)

The system, created by decree in 1961, was late in developing compared with some other Latin American countries. Its reception by the Venezuelans has been so vigorous that by 1970 it surpassed all other countries in accumulated savings.

TABLE II-6 [26]

Total Savings Accumulated and Loans Given by the Savings and Loan Associations Since 1962

Year	Accumulated Number of Members	Accumulated Savings Deposits (Thousands of Bs.)	Accumulated Number of Mortgage Loans	Accumulated Mortgage Loans (Thousands of Bs.)
1962	661	644	1	70
1963	4.280	19.339	286	18,219
1964	13.014	43.937	1.797	97.161
1965	10,977	46.371	2.238	116.949
1966	9.260	16.675	1.271	66.670
1967	13.269	53.257	1.113	64.697
1968	32.749	118,985	1.801	114.612
1969	43.206	184.349	3.449	235.402
1970	55.309	252.664	4.074	279.554

The initial seed capital came from a joint \$17 million loan from AID and the Venezuelan government. At the outset, the interest of the government in the system came partially because it hoped to revitalize the construction industry which was in the midst of a serious recession. Initially, the system pursued a dual policy. On the one hand, it tried to make the largest number of loans possible to quickly spread the image of confidence and dynamism. On the other hand (contrary to the savings and loan systems in other Latin American countries), in order to capture a large volume of savings quickly, it channeled its loans to high and high-middle class incomes. [27] It hoped to attract these income groups because they have the highest savings power.

This policy soon created serious bottleneoks that endangered the growth of the system as funds depleted rapidly. Despite several new contributions by the government, the excess of loans over savings soon drained the funds. When the public realized the difficulties of the savings and loan associations, it became discouraged and refrained from joining; some discontinued their membership, aggravating the situation still further. As is shown in Table II-7, the outside capital channeled through the National Commission (later the National Bank) of savings and loan associations, surpassed the savings captured between 1965 and 1968. [28]

TABLE II-7

Financial Composition of the Savings and Loan System in Percentages by Origin of Funds from 1963 to 1970

	1963	1964	1965	1966	1967	1968	1969	1970
Outside or Seed Capital	29.7	44.9	51.8	58.3	58. 8	51.5	39.7	33.9
Accumulated Savings	61.3	55.1	48.2	41.7	41.2	48.5	60.3	66.1

The change in trend and rate of growth came as a result of the Creation of the National Bank of Savings and Loan Associations in 1966, which provided the system the needed stability. There was also a change in policy orientation, whereby the loans would be kept in line with accumulated savings. Furthermore, the base was broadened by shifting services to middle income groups.

The basic functions of the National Bank are to promote, organize and authorize the associations; to provide them with the necessary liquidity; and to guarantee the mortgage loans as well as the savings of the members. The starting capital of the Bank was set at Bs.200 million.

Although not stipulated in the constitution, loans have until now been directed exclusively to the purchase or construction of new homes, in order to stimulate the construction industry. The families must have saved 10 percent of the house value and lot value and cannot own another home. The financial terms are: [29]

- a) The loans cannot exceed 90 percent of the total house value for the first Bs.50,000 and decrease in percentage as the value increases; the upper loan limit is Bs.100,000;
- b) The amortization period may not exceed 25 years for house values up to Bs.50,000 and 20 years for values above;
- c) The interest rate averages eight and $\frac{1}{2}$ percent, which includes mortgage and fire insurance (frequently life insurances are also required);
- d) The total sum of monthly payments of all loans (first and second mortgages) cannot exceed 33 percent of the family's monthly income.

The ability shown by the system to develop new programs and its modern administrative structure, has made it the most dynamic financial institution in the country. New programs have been developed to induce savings habits among young students and workers, and others to stimulate the construction industry through construction loans to build middle income housing. These short-term construction loans are provided under the stipulation that the houses be destined to savings and loan members.

In 1970 a promising new stage was initiated in the saving and loan institutional evolution, when the Federal Savings and Loan Banks of Boston and New York offered a \$20 million loan. Through the guarantee of AID this loan will finance exclusively the construction of housing units for the low middle income groups (Bs.1,000-1,800 per month) which is presently the most neglected income group. This in turn will stimulate the savings among this group. The relationship, experienced so far in the system, has been of thirteen new savers for every loan given. [30] Furthermore, this loan will permit the National Bank to initiate a secondary mortgage market, which is already in the planning stages. [31]

III. MORTGAGE BANKS (private)

As mentioned above, mortgage banks have been operating since 1958. Their two main functions are to provide mortgage loans for the purchase, construction or improvement of buildings;

and the cancellation of prior mortgage or construction loans. The funds stem almost exclusively from the mortgage bonds the banks place in the capital market. Given the lack of a dynamic stock exchange in Venezuela, bonds have always been very popular among private investors.⁶ Furthermore, many financial institutions are required by law to invest some part of their reserves in bonds. The bonds carry interest of 8 percent, the first 6 percent income tax free. Even though the banks are authorized to issue bonds of up to 20 times their capital, they have never exceeded 10 times.

During the first years, the lack of liquidity of the mortgage bonds made their placement difficult. As with the savings and loan associations, the government helped the mortgage banks and purchased Bs.200 million from funds obtained from the Export and Import Bank and a group of oil companies. [33] The liquidity problem persisted, however, until 1963 when the Central Mortgage Bank was created (under the auspices of the government) which developed a secondary mortgage market for the bonds. Although the Central Mortgage Bank's impact was more psychological than financial, its declared policy of rebuying bonds at par value gave the investors the confidence they wanted and the bond market boomed.

^e"Fixed value assets predominate in the Caracas Stock Exchange, in particular the government and the mortgage bonds which represented 79 percent of all transactions in 1965." [32] Looking at subsequent years it is clear that this situation has not changed much.

During 1966 when there was a general tightening of world financial markets, the mortgage banks almost had to suspend their loan operations. Since bond prices fall when interest rates go up, mortgage bonds became less attractive to the investor. At this point the government made a promise of buying Bs.75 million worth of bonds for the following four years, under the stipulation that this be used to finance homes under Bs.80,000.

TABLE II-8 [34]

Total	Amount	of	Bonds	Issued	and	Mortgage	Loans
	Given	Ъу	Mortgag	e Banks	3 Sir	10e 1959	

Year	Number of Banks	Paid Capital and Resources	Amount of Mortgage Loans	Amount of Bonds Outstanding
1959	1	20,2	59,3	45,0
1960	1	20,5	64,1	50,0
1961	3	43,4	73,3	44,5
1962	4	57,9	157.7	108,6
1963	5	70,4	255,9	214,5
1964	5	74,0	397,0	327,5
1965	5	79,1	554,9	508,9
1966	5	87,9	649.5	596,7
1967	5	99,8	731,0	723,3
1968	5	104,8	969.5	950,5
1969	6	129,2	1.204,9	1,175,1
1970	8	169,1	1.590,6	1.562,9

Theoretically, these banks are authorized to offer loans for up to 75 percent of the construction value and up to 25 years at an interest rate of 11 percent. In reality the loans do not exceed 60 percent of the total house value and have averaged amortization periods of 10 years. [35] Furthermore, as is shown in Table II-4, the effective interest rate was closer to 14 percent. A study of a sample of mortgages from the largest bank confirmed that these banks cater to high-income groups. Two-thirds of the sample consisted of loans given to families with monthly incomes above Bs.3,000. They devoted in general between 10 to 20 percent of their income to housing. [36]

As in the savings and loan associations there has been a tendency in recent years in the mortgage banks to increase their concern for families with lower incomes, largely because of governmental pressure. In 1970 they signed an agreement with the government, whereby they would assign yearly 15 percent of their bond issues to mortgage loans for middle and lower-middle income groups. [37] This contract, in addition to new laws which reduce the commissions charged by banks, is likely to broaden the base of borrowers.

The Construction Industry

The construction sector has played a very important role in the development of Venezuela. From 1960 to 1969, of the total fixed investment 66 percent was in the form of construction. [38] The main reason for its importance is the high proportion of the public investment that goes into construction. Public works have been the traditional way of investing the large revenues collected from the oil by the Venezuelan government. At present the public sector accounts

for about half of the investment in construction. [39] The shares of each sector (public and private) devoted to housing vary significantly, however. Whereas between 1967 and 1970, 49 percent of the private gross investment in construction went into housing, the public sector directed only 19 percent of its gross construction investment to housing. These figures are no indication of the total impact each has on the housing market, for although the private sector invested 3.8 times more than the public sector in housing, it produced only half the units. This is a reflection of the high value of most of the housing built by the private sector, which averaged Bs.127,000 in 1968. [40]

It is very difficult to estimate the actual private effort that goes into housing. The only official figures available refer to building permits registered each year in the 43 largest cities. These do not indicate how many units were actually started or finished during that specific year. Furthermore, a survey by the Banco Central in 1969 for Caracas indicated that the actual final value of the house is on the average 60 percent above that registered in the building permit. [41] This difference is not due to inflation. Official figures further underestimate total private investment in housing since they do not include ranchos. The following table gives an appraisal of the capital invested by rancho dwellers. Even though their investment per unit is low, the aggregate value is large.

TABLE II-9 [42]

Housing Units Built By the Private Sector Between 1965 and 1968

	1965	1966	1967	1968
Building permits	15,228	11,252	8,769	11,230
Squatter settlements	39,667	39,754	44,403	42,794

The construction industry is highly sensitive to economic fluctuations given its close ties to the level of investment. Its fluctuations tend to be wider than those of the rest of the economy. Venezuela is no exception and it is well illustrated in the record of the past 20 years. During the fifties while the GDP grew at a geometric average rate of 8.3 percent, the rate of growth of the construction industry was 8.4 percent. After a short recession in the early sixties when the economy decelerated to a 4.6 percent rate of growth for that decade, the construction industry's rate fell much more to 2.6 percent (see Figure II-1). [43]

Hence, as we have seen, the share of GDP that goes into construction and, in particular, housing, has dropped. Yet, the trend has been towards increasing the participation of the private sector, particularly during the last two years. This change in trend came mainly as a result of new decrees and resolutions passed by the government and adopted by financial institutions. The government hopes to spur the construction industry through these new incentives.



Percentage Change in Gross Domestic Product Versus Gross Construction Product The main problems that face the construction industry are financial.^f There are in turn three aspects to the financial side:

- a) obtaining the initial capital to form a construction firm (direct financing),
- b) financing the production itself (working capital medium or short term),
- c) financing the purchase of the production by the customers (indirect long term).

Most direct financing capital of construction corporations originates either from the companies' own reinvestment or from stocks or bonds. In the case of small construction entities the capital stems from personal loans. The above two forms of capital supplies have been relatively adequate, but the industry has often suffered from the complementary medium term loans it needs from the banking system as working capital. [44] As we have seen, the mortgage banks and savings and loan associations have intensified their efforts to fill this gap.

Yet, as the constructors themselves recognize, it is the indirect financing which has caused the most serious bottlenecks in the industry. The uncertainty as to the marketability of its product has forced them to build high income housing. Since this market reaches a point of saturation quickly, they were unwilling to expand their capacity unduly,

^fPart of the financial problem is due to the large amounts of government receivables held by construction firms. The government debt amounted to Bs.750 million at the end of 1970.

which in turn made cost reduction difficult. Prefabrication methods have had limited application thus far. The minor reductions in cost experienced in other countries has not encouraged their use.

Governmental decrees, mentioned above, are directed towards stabilizing the industry, and providing the incentives to build homes for the middle and lower middle groups. Following are some of the main decrees: [45]

- a) Income tax exemption
 - 1) 10 years exemption for rental housing units which rent does not exceed Bs.900/month in Caracas or Bs.750/month in the rest of the country.
 - ii) up to 13 years exemption, depending on the financial terms, for housing units whose sale price does not exceed Bs.60,000 without land or Bs.80,000 to 100,000 with land.
- b) Guarantee of investment
 - 1) if a construction company building housing units below Bs.45,000 has not sold a unit after two years, the Banco Obrero will purchase it at 95 percent of its value.
 - if a buyer fails to comply with its payments for six months, the Banco Obrero will pay 95 percent of the remaining payments.
 - iii) if a buyer cannot pay the initial down payment, the Banco Obrero will lend him 15 percent of the house value for this purpose under easy credit terms.

It is not likely that the induced increase in housing construction will create serious bottlenecks in the supply of materials. In the case of cement, which is the main material used in home building, Venezuela has been a net exporter and is proud to claim the high investment productivity in this industry. The plumbing industry also has an excess of capacity. The newly expanded steel industry has covered almost all the needs of the construction sector. Wood is imported, by and large. However, it is a minor component in housing construction itself. Furthermore, the bolivar is freely exchangeable and because of Venezuela's ample supply of foreign exchange, the duties on products not produced nationally are very low, including machinery.

The following table indicates the steady increase of local production versus imports in the construction materials industry. [46]

TABLE II-10

Apparent Consumption of Construction Materials Between 1961 and 1967 (Millions of Bs.)

	1961	1962	1963	1964	1965	196 6	1967
Production	292	289	353	446	529	589	650
Imports	211	248	258	270	329	249	241

This relative abundance of materials is reflected in the low rates of inflation of construction material costs despite the growth of housing construction. Using 1963 as base year, the index in 1970 was 123. [47]

It is the supply of skilled construction labor which may prove to be the main bottleneck to an ambitious housing program.

"Venezuela has a managerial organization, drawn to a large extent from foreign immigrants, with sufficient technical capacity to undertake extensive new programs. It is also an undisputed fact that the industry has a potential capacity to build

100,000 houses per year. If there is one area, however, which could cause problems, that is in the supply of skilled construction labor." [48]

The National Vocational School (INCE) has made some efforts to remedy the situation with little success for a variety of reasons. Meanwhile, skilled workers continue to receive wages far above those stipulated in the union contracts.

Employment creation is a very crucial issue, particularly for Venezuela. If the construction sector continues employing an average of two to three man-years per housing unit, a boom in the housing industry could have important conomic implications.

Land Value

Land value increases in those areas of rapid urbanization. The problem becomes particularly acute when there are physical limits to a city's expansion, as in Caracas. There, the average value per square meter has risen from $Bs.76/m^2$ in 1951 to $Bs.181/m^2$ in 1959 and up to $Bs.250/m^2$ by 1965. [49] The reason for this increase in land value is complex, but it arises basically from the peculiar characteristics of land as a capital asset, and from the private appropriation of a good whose actual value is determined by the growth of the community.

Land is the safest form of investment in an economy where investment opportunities have been limited. Furthermore, it is also the most common form of speculation. This speculation has been facililited by the lack of municipal

city planning, which did not ensure for the control of the land required by the city's expansion. It is not uncommon for a government's low cost housing project to be frustrated because of the price of land. The response is to build in poorly located areas, such as the new satellite city Caricuao, in Caracas. This new government housing development of 150,000 inhabitants had to be built at a considerable distance from the economic center of activity of its inhabitants.

Increases in land value follow a pattern of stages as urbanization progresses. These are: [50]

- 1) <u>Zoning</u> the incorporation into the city limits of an area which was "virgin" or used for agriculture
- 2) Services and Infrastructure when either through private initiative or public investment an area has been provided with the necessary services and roads for urban development.
- 3) Rezoning the change in zoning codes which allow increases in the density of population or permit the use for commercial purposes of a residential area.

These stages proceed as the demand for land increases. Yet the fact that the supply is fixed and is mainly in the hands of institutionalized real estate oligopolies distorts the usual laws of supply and demand. These oligopolists, who control the land supply, are able to pursue their unilateral interest by fixing prices and leaving extensive areas of land unused in expectance of future price increases. By 1965 the value of land in Caracas had reached such levels that no matter how far the cost of construction fell, the low middle and low income groups would not have had the opportunity of acquiring housing except in land owned by official agencies. During that year, in areas with a density of 1,000 inhabitants/ hectar, the cost of land was on the average the same or slightly higher than that of the housing structure. In high residential areas in the city with lower densities (200 inhabitants/hectar) the cost of land surpassed by far that of the structure. [51]

To remedy the situation the government has considered taking several steps, already in use in other countries. These are not likely to be implemented, however, because of vested interests in the power structure.

- a) To modify the "law of public expropriation" and give the official agencies more power to expropriate, with adequate compensation, land which may be used for the public welfare.
- b) To apply the "surplus value right" whereby the increases in the value of an area of private land due to public investment in the community is appropriated by the government.
- c) To introduce "progressive land taxation". This tax reduces speculation by penalizing land which is kept idle on a progressive tax basis (according to number of years left unused).

Summary

Despite steady high rates of growth for 45 years, the Venezuelan economy has not been able to provide adequate housing to a large segment of the population.

Rapid urbanization and one of the highest population growth rates in the world have been partially responsible
for the housing shortage. The main causes, however, have been the uneven distribution of income and the lack of an institutionalized mortgage market that would provide loans at adequate credit terms. Land speculation has made matters worse.

Recent trends have opened the gates towards an improvement, although not a solution, of the housing problem. Mortgage banks and savings and loan associations have been created which have spurred the private housing market. In addition, the public housing agencies have introduced new programs that may prove to be more successful than previous ones. Foreign private capital will complement local funds directed to housing.

The capacity of the construction industry in Venezuela is presently adequate for a progressive expansion of housing demand. The only bottleneck could arise in the supply of skilled labor.

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CHAPTER III

THE MODEL

Methodology

The model consists of a set of multiple regressions that test the hypotheses regarding the influence on demand for housing of a set of socio-economic variables. Demand is expressed mainly in terms of monthly housing expenditure. The variables included in the model and the functional relationships were chosen on the basis of economic theory, empirical studies in other countries, and on examination of past Venezuelan data.

The basic regression forms used are four:

- normal linear the coefficients are marginal propensity values and are additive;
- 2) double-logarithmic the coefficients give directly constant elasticity values;
- 3) semi-logarithmic similar to the double-logarithmic form, but the elasticity values are non-constant and inversely proportional to the level of the dependent variable;
- 4) quadratic the relationship between the explanatory and the dependent variable is parabolic.

Functional forms b and c are not linear, but they can be transformed and made linear in the parameters. After the transformation, ordinary least square analysis can be applied. Dummy variables are used extensively in case of qualitative variables. They are also applied when a quantitative coefficient is suspected of being non-linear.

"By partitioning the scale of a conventionally measured variable into intervals and defining a set of dummy variables on them, we obtain unbiased estimates since the regression coefficients of the dummy variables conform to any curvature that is present." [1]

The analysis is based on cross-section data. There are frequently problems of heteroskedasticity and multicollinearity in cross-sectional analysis. Pooling time-series with oross-section data lessens these statistical problems. Unfortunately, there are no housing time-series data available in Venezuela. The large number of observations collected have facilitated the analysis. Such a large sample allowed the groupings of data at all levels and the exclusion of odd cases (which would have distorted the results) without reducing the degrees of freedoms significantly.

Description of Variables and Their Functional Relationships

Housing is traded both in an asset and a service market. In the asset market, the purchase of a home reflects a demand for a stock of accommodation services as well as an investment. It is a demand for a stock of accommodation services because the home provides a flow of services beyond the period in which it was purchased. It is an investment because a home can be resold at a gain or a loss from its original value.^a In the service market, the demand for housing reflects a demand for accommodation services at one point in time (flow).

Given the dual nature of <u>demand for housing</u> (X), it is essential to separate owners from renters. In the case of renters, housing demand is expressed in terms of monthly contract rent. For owners, I use monthly payments, adjusted or unadjusted for the downpayment, as a measure of housing consumption. Paid-up owners have been excluded from the analysis. I found the information on house values too inaccurate to impute rents that would be meaningful. Furthermore, even if updated house values were available, there has been no research done on how to accurately impute rents. Only in the case where imputed rents were reported in the surveys, such as data from the University of Carabobo and Corporacion Venezolana de Guayana, were these applied in the analysis, mainly for comparisons.

Rents more closely reflect desired levels of housing consumption than monthly payments, adjusted or unadjusted.

^aAll too frequently economists underestimate the importance of homeownership as a means of accumulating capital. In the U.S.A. "homeownership is clearly the most important method of wealth accumulation used by low and middle income families in the post-war period. Equities in single-family, owner-occupied structures account for nearly one-half of all the wealth of the lowest income group...and one-third of the wealth of all U.S. households earning between \$10-15,000 in 1962 [2]. Thus, to view housing demand merely as a demand for a stock (owners) or a flow (renters) of accommodation services would be an oversimplification of the nature of housing.

Renters can move and adjust their housing consumption needs more easily. Since stock adjustments are infrequent because the purchase of a house entails a large cash outlay, monthly payments often reflect past or expected housing consumption needs.

Comparing renters with owners has the additional problem of relating all the services which are included in the cash outlays. While contract rents sometimes include utilities or furniture, monthly mortgage payments usually fail to include property taxes, insurance or maintenance costs. Fortunately, property taxes are low in Venezuela and it is unusual for contract rents to include furniture or utilities, with the exception of water.

Lastly, since "housing is fixed in location, consumers buy not merely a quantum of housing, but also a package of environmental and governmental services which often have little to do with the shelter as such". [3] In order to reduce the influence of these exogenous factors I have performed regressions for different cities and sectors within the cities.

Of all the explanatory variables in the model, the most significant, according to theory, is <u>income</u> (Y). The problem arises as to how accurately current income reflects household behavior with respect to a durable good like housing. All studies have consistently shown that if there is one type of expenditure which fits the permanent income hypothesis, it

is housing. Even though high discrepancies as to the exact value of the income elasticity of demand for housing have characterized the work in this area, they all agree that the elasticity is larger with respect to permanent or normal income than it is for current income [4].

If consumer units are completely alike with respect to normal income, then all the difference in current income represents transitory income. Several techniques are used throughout the analysis to separate this transitory income. The main approach used is grouping data into homogenous subsets in order to keep constant some of the "nuisance variables" that exist because of large family differences.

The percentage of income spent on housing depends on the origin of the income. Given the same income, a smaller share of the income will be used for housing consumption the larger the number of earners. [5] The additional income from earners other than the main earner (EY) is viewed as more transitory and thus not used for housing consumption. This situation arises particularly in those households that are formed by principal and additional families.^b Not only are the earnings of additional earners viewed as more temporary, but their expressed desire to leave when conditions permit affects the housing space considered necessary. I test for the influence of <u>additional families</u> (H) in the household by performing a regression with (H) as a dummy

^bThe definition of an additional family was given in Chapter I.

variable, with value zero if no additional family is present, and one, if otherwise.

There are two components that determine the value of the dwelling purchased; quality and quantity (space) desired. Inasmuch as household size (N) affects directly the quantity of housing needed, there should be a positive correlation between housing expenditure and family size. However, previous studies have shown that although the correlation is first positive, it becomes negative after (N) reaches a certain peak. [6] The reason given for this fall is that the largest families are usually those in the lower economic strata. This is not likely to be the case in Venezuela. Survey information has shown that household sizes are quite constant irrespective of income level.

The influence of income and substitution effects provides a better explanation for the fall in expenditure after a certain size of (N) has been attained. The income effect refers to the drop in the standard of living of the household on a per capita basis with an increase in (N). The substitution effect, in turn, is caused by the shift of expenditure from housing to other needs. In addition, as in food consumption, there are economies of scale in the consumption of housing services which further reduce the likelihood of linearity.

From the above, I assume the functional form of (N) with respect to expenditure on housing to be non-linear. I will test for this assumption with dummy variables, semi-log and quadratic functions.

Age of the household head (A) is an instrumental variable which reflects the life cycle stage of the family. Not only does the number of children vary with (A), but so do income, future expectations and financial assets, all of which have an effect on housing demand.

Adjustments between desired and actual expenditure on housing are notorious for their lag. In the case of owners, part of the disequilibrium is due to the large investment required for the purchase of a home. The disequilibrium is most noticeable for young household heads.

Over the life cycle, family size and income fluctuations do not tend to be synchronized. During the early family stages, family size increases, which creates a need for more housing space. Yet, at this stage, income growth usually lags behind family growth. It is when the family stops growing that incomes tend to reach their peak, enabling the family to close the gap between desired and actual stock of housing. This adjustment is said to be lagged because housing need preceeds paying capacity. In the case of old household heads, the disequilibrium is frequently reversed, so that available housing exceeds desired housing.^C

Several studies have found (A) to be an important and statistically significant variable in demand for housing. [8]

^CAtkinson found that "the value of new houses purchased by households with male heads increased directly with age in the younger age groups, reached a maximum in the intermediate age groups, and declined for the oldest age groups." [7]

I hypothesize again a non-linear relationship between (A) and (X) or (M) and use the same functional forms applied in the analysis of (N).

Education (E) is closely related to income and may present problems of multicollinearity. However, for constant income, I assume a positive and linear correlation between preference for housing consumption and educational level. As Morgan states,

"While formal education is clearly important in determining not only income, but consumption of housing relative to income, the explanation of the fact is probably not because of differential longrun or life-time incomes, past or expected, but because of more immediate direct effects of education, such short-run income security and stability, the capacity to plan ahead, and the resulting willingness to make major contractual commitments." [9]

Education was measured according to years of schooling.

Education has been preferred to <u>occupation</u> (0) as an explanatory variable because of the difficulty in measuring occupation. Whenever I introduce occupation as a variable, it is in the form of dummy variables.

Other than income, it is availability of credit with long enough <u>amortization periods</u> (P), low <u>interest rates</u> (I) and <u>downpayments</u> (D) that has traditionally been the most limiting factor to demand for housing, particularly for the middle class. [10] The "multiple-term hypothesis" states that the three-credit conditions have a direct association. The implication is that decreases in the interest rates tend to be associated with extensions of amortization periods and lower downpayments, and vice-versa. One of the explanations given for this hypothesis is given by Muth.

"A fall in the pure rate of interest...means that the cost of some low downpayment and long-maturity loans considered too expensive at the higher rate falls enough to induce borrowers to make loans of this kind." [11]

As I indicated in Chapter II, the "multiple-term hypothesis" is historically valid in Venezuela. However, it is difficult to assess a priori which of the three credit terms has individually had the most influence on housing demand. Gelfand found that the most sensitive factor in mortgage credit is the downpayment requirement and the least sensitive, the maturity period. [12]

I hypothesize that demand for housing is most responsive to changes in the downpayment. While interest rates have fallen to some extent, and amortization periods increased considerably in Venezuela, it is the reduction in downpayments as well as the increased availability of funds (in particular for the middle income groups) which was most instrumental in broadening the borrower base. I test for the significance of (D) and the sign of its coefficient in the regression analysis using the variable loan/value ratio.

Downpayment was also used to adjust for monthly payments reported. Two owner households with identical homes will report entirely different cash expenditures depending on the downpayment they make. In order to compare the two,

some adjustment is needed. Downpayments are funds with an opportunity cost which come either from savings, which could have been invested elsewhere, or from a second mortgage, which was borrowed and interest paid on. The sample from B.N.A.P. indicates that in most cases the funds come from both sources.

Monthly payments and income should thus be adjusted upward by a rate which expresses either the interest rate paid, or the return foregone on the downpayment. Given the present interest rate structure in Venezuela and applying tax-free bond yields as a yardstick, I imputed an interest rate of .8 percent per month.^d

Economists disagree as to the proper way of measuring the cost of the mortgage and the way in which the borrower weighs the different financing alternatives open to him. Lee argues that households consider both the mortgage rates and the contract length jointly as the burden of mortgage cost. [13] Thus, even though demand will increase with lower interest rates and with a smaller downpayment, the same is not true for amortization periods, because maturity periods increase the total interest cost. He uses a measure of the interaction (I x P). I apply this variable to my analysis

^dTo be more correct (P) of the second mortgage should have been considered. If it is shorter than in the first mortgage, the principal will have to be repaid at a faster rate which would increase the monthly payments proportionately. Given that households allocate a certain percentage of their income to housing, this will force them to buy a lower-priced home.

but I drop (I) because it is constant in my sample from B.N.A.P. One problem with Lee's view is that if (P) increases the total interest cost, so does a larger mortgage because this would also increase the total amount of interest the borrower pays the lender. "This would mean that the larger the debt and the longer the maturities the more demand would fall." [14]

Sex of the household head (S) has not been considered a major explanatory variable in the studies of demand for housing in developed countries. I consider (S) to be crucial in the case of Venezuela because of the large number of households with a female head. Female heads are most common in the lower-income groups. The abandonment of the family by the male creates an atmosphere of instability which is conducive to a set of priorities and expectations different from those of a normal household.

It is difficult to know a priori how housing demand is affected by (S). However, the fact that employment opportunities and job security differ widely between men and women suggests that female heads will tend to avoid large debts or high monthly cash outlays on housing. Using dummy variables, I test for the difference between female and male heads with respect to (X).

There are other explanatory variables which are used in the analysis to which I will refer as they are successively applied in the next chapters. These relate in particular to the physical characteristics of the housing unit. I will study their correlations with (Y), (N), (X) and (M) and the trade off effects between the quality and quantity components of housing as demand rises.

Summary

In this chapter I have explained the analytical approach to the model, the economic reasoning for the choice of variables and the functional forms assumed. I have stressed the statistical problems involved in measuring demand for <u>housing</u> (X) and <u>income</u>(Y). Measuring (X) is difficult because of the differences in housing with regard to quality, location and tenure.

I have attempted to minimize the measurement problems through means of instrumental variables and sample stratification, which reduce the differences between consumer units and the product purchased.

Usually in cross-section analysis, there are problems of multicollinearity and heteroskedasticity. Multicollinearity refers to the interrelation between the explanatory variables. Increases in income are accompanied by a rise in education, number of earners and age. Most other variables are also interrelated to some degree. A high degree of multicollinearity is harmful in the sense that the estimates of the regression coefficients are imprecise. A rule of thumb used in econometrics is that:

"multicollinearity is not necessarily a problem unless an explanatory variables' multiple correlation

with other members of the independent set is greater than the dependent variables' multiple correlation with the entire set." [15]

The violation of the homoskedasticity assumption leads to unbiased and consistent but inefficient estimates of the regression coefficients. The (t) ratios are affected due to the bias in the estimates of the standard errors of the coefficients. In the following chapter I discuss how I correct for heteroskedasticity.

INDEX OF VARIABLES

1.	Expenditure on Housing	
	Rent or Imputed Rent	х
	Monthly Payment	M
	Adjusted Monthly Payment	M *
2.	Income	
	Current Income	Y
	Adjusted Income	۲ .
3.	Age of Head	A
4.	Members in Household	N
5.	Education of Head	E
6.	Occupation of Head	0
7.	Sex of Head	S
8.	Number of Earners	EY
9.	Down Payment	D
10.	Amortization Period	Р
11.	Interest Rate	I
12.	Total Value	v
13.	Loan	L
14.	Rooms	R
15.	Structural Cost	s _t
16.	Structural Area	a

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17.	Land Value	Т
18.	Land Area	A
19.	Household Type	Н
20.	Total Expenditure	TEXP

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CHAPTER IV DEMAND FOR HOUSING:

ANALYSIS OF NEW MORTGAGORS

Sample Characteristics

The data in this analysis are based on 3,194 approved mortgage loans given by twenty-two savings and loan associations in Venezuela during 1970. Data on new mortgages have the analytical advantage of providing information at the time of the purchase. The monthly payments on new loans more closely reflect the current needs and resources of the household than the payments on a loan received in the past. The gap between actual and desired stock of housing is less significant.

The members of the savings and loan associations belong basically to middle and upper-middle income groups. In my sample, income of the household head ranged from Bs.800 to Bs.17,400 a month, with a mean of Bs.3,140 and a median of Bs.2,700. The loan policy of the savings and loan associations may have discouraged high-income groups from joining. The mortgage loan limit is Bs.100,000, regardless of house value or savings deposited. If the mortgagor intends to buy an expensive house he may prefer to borrow from the private mortgage banks, which lend up to 50 percent of the purchase

value, although at higher interest rates and shorter maturity periods. The extent to which some high-income households borrowed from savings and loan associations is a reflection of the choice made for smaller loans at lower interest rates and longer maturity periods. Income groups below Bs.1,200/ month apply for loans with the Banco Obrero because they usually cannot meet the requirements for eligibility of the savings and loan associations.

Interest rates are fixed at 7 percent. Only insurance fees vary between loans and may raise the average interest rate to 8.5 percent. The savings and loan associations can maintain low interest rates because of the partial guarantee of the loans and savings by the government.

Maturity periods ranged from 5 to 27 years with a mean of $19\frac{1}{2}$ years. The shorter maturity periods applied to the larger loans. The associations' limits are 25 years for house values up to Bs.50,000 and 20 years for higher house values.

A comparison of housing payments before and after the new purchase indicates an average increase from Bs.500 to Bs.633 per month (see Table IV-1). Thus, most loan applicants upgraded (measured in monetary terms) their housing consumption. The increase was smaller for apartments, which may reflect more frequent household adjustments in housing stock when a smaller investment is required. Apartments are usually cheaper than homes and are more frequently rented

than homes. Of the total sample, 14 percent had previously owned a mortgage-free house, 81.4 percent was renting or still paying on the mortgage of their house, and 4.6 percent was either living with their family or in some institution.

TABLE IV-1

Purpose of the Mortgage Loan and Tenure at the Time of Application of Mortgagor

		Previous Ten	nure	Previous Renters gaged Ow	or Mort- mers
Purpose of Mortgage Loan	Paid Up Owner (%)	Nortgaged Owner (%)	Living With Family,Etc. (%)	Present Payment (Bs.)	Previous Payment (Bs.)
Homes	15.0	81.6	3.4	696	499
Apartments	13.6	75.8	10.6	586	501
Total	14.0	81.4	4.6	633	50 0

Data Arrangement

Two instrumental variables were used: cities and purpose of the loan (dwelling type). As mentioned in Chapter III, instrumental variables are used to eliminate or to minimize the random error of explanatory variables by grouping similar consumer units. The instrumental variable itself does not enter the equation.

According to "purpose of the loan", the data have been grouped into multi-family (apartments) and single family (homes) housing units. Compared with homes, apartments are lower in value, have smaller structural areas and are bought by younger heads of households with lower incomes (see

Tables IV-2 and IV-3). Apartments are highly concentrated in Caracas. 93 percent of the total number of loans given for the purchase of apartments were in Caracas.

With respect to "cities", the sample was broken down into Caracas, Maracaibo, Valencia, Barquisimeto, Ciudad Guayana, and the remainder of the cities combined (nine in total). Incomes, total house values, and value of land per square meter are considerably higher in Caracas. Higher land values forced the <u>Caraqueños</u> to buy smaller land areas although they built larger and more expensive structures than mortgagors in any other city.

The data were further stratified by income levels to study the relationship between income changes and all other variables.^a Odd cases, such as student applicants, whose socio-economic status may change rapidly, and recent foreign immigrants, were excluded from the sample.

Housing Demand with Respect to:

1) Income (Y)

The share of income spent on housing (M/Y) ranged from .11 for the rich to .30 for the low-income groups (see Table IV-4). The ratio falls progressively from low to

^aGrouping of income also reduces heteroskedasticity problems. Heteroskedasticity implies that the variance of the disturbances is not constant for all observations. When dealing with income and expenditure data, the observations may involve substantial differences in magnitude and disturbance variances. "At low levels of consumption, the average level is low and variation around this level is restricted. These constraints are likely to be less binding at higher income levels." [1]

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Table of Averages of Apartment Mortgages: Credit Terms and Other Characteristics By Income Group and City

	Sample Size	Monthly Income	Adjusted M. Income	Monthly Payment	Adjusted M. Payment	Down Paym.	Tot al Value	Str. Area	Household Size	Rooms
Total Sample	1206	3060	3210 [.]	580	736	19,600	84,500	66	3.47	2.9
<pre>1. Total Sample Income 0-1500</pre>	76	1380	1480	407	506	12,400	58,900	72	3.12	2.1
1501-2000	259	1810	1910	487	585	12,300	67,300	84	3.38	2.5
2001-3000	437	2560	2710	587	735	18,600	85,000	66	3.38	3.0
3001-4000	228	3530	3720	648	837	23,800	95,500	111	3.60	3.2
4001-above	188	6200	6440	697	940	30,400	106,400	120	3.80	3.3
2. Caracas	1127	3030	3190	578	738	19,200	85,000	67	3.45	
3. Maracaibo	28	3980	4110	671	662	16,000	85,600	146	3.21	
4. Barquisimeto	7	3060	3130	488	559	8,900	62,200	110	4.43	
5. Cd. Guayana	. .	0777	4540	604	701	12,200	77,000	122	2.20	
6. All Other	39	3130	3250	573	692	13,700	78,600	120	4.13	
Note: Throughou	 It this cl	anter and	the next a	ll variable	es that have	: monetary	values ar	e expres	sed in boli	vars,

5 and those with area values in square meters (m^2) .

				Table Ot	of Averag her Chara	es of home Mc teristics by	rrgages: / Income G	Credit T roup and	erms and City					
	S S	umple iize	Monthly Income	Adjusted M.Income	Monthly Payment	Adjusted M.Payment	Down Payment	Total Value	Struct. Value	Struct. Area	Land Value	Land Area	Household Size	Rooms
Total Sample		761	3,432	3,726	653	647	36,700	109,500	78,500	182	28,100	508	4.5	4.3
 Total Sample Income 	مب ون													
0-150	0	63	1,262	1,366	329	433	13,100	50 , 600.	39,4 00	115	12,100	380	3.9	3.3
1501-	2000	86	1,838	1,975	097	597	17,200	70,100	54,000	141	15,700	458	4.1	3.6
2001-	3000	235	2,561	2,761	609	810	25,000	94,000	70,700	169	22,000	667	4.4	4.1
3001-	4000	172	3,557	3,685	728	1,056	41,100	122,200	86,900	198	31,900	503	4.3	4.5
4001-	above	205	5,816	6,325	834	1,343	63,600	154,500	104,700	226	43,200	165	4.8	4.9
2. Carac	88	266	4,107	4,621	758	1,272	64,200	148,600	96,200	192	45,400	456	4.5	
3. Marac	aibo	93	3,055	3,194	241	660	17,500	77,200	60,000	148	17,200	454	4.0	
4. Valen	cia	77	3,014	3,228	769	908	26,800	100,300	74,100	172	24,300	409	4.2	
5. Barqu meto	isi-	47	3,316	3,499	592	775	22,800	92,400	75,700	199	16,700	618	4.2	
6. Cd.Gu	ayana	22	2,771	2,918	573	720	18,400	81,800	61,900	156	18,800	582	3.4	
7. All O	ther	289	2,842	2,905	580	737	19,600	85,200	67,900	174	17,300	535	4.8	

TABLE IV-3

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1V-4	
TABLE	

Means of Share of Income Spent on Housing and Ratios of Downpayment to Total Value by Type of Dwelling, Income Group and City

		Total Sample	0- 1500	1501- 2000	2001- 3000	3001- 4000	4001- above	Cara- cas	Mara- caibo	Valen- cía	Barqui- simeto	C1udad Guayana	All Other
71 / A	Homes	.19	.26	.25	.24	.21	.14	.19	.18	.23	.18	.21	.20
1 /12	Apartments	.19	.30	.27	.23	.18	.11	.19	.17		.16	.14	.18
14/12	Homes	.25	.32	.30	. 29	.27	.21	.28	.21	.28	.22	.25	.25
1 / H	Apartments	.23	.34	.31	.27	.22	.15	.23	.19		.18	.15	.22
11/ C	Homes	.34	.26	.25	.27	.34	.41	.43	.23	.27	.25	.23	.23
۸ / ת	Apartments	.23	.21	.18	.22	.25	.29	.23	.19		.14	.16	.19

high income groups, which fits Schwabe's Law of Rent. This law stipulates that the higher the income of a family, the lower the proportion of income reserved for housing. The average ratio for the total sample does not differ between homes and apartments, but the difference between the low and the high income levels is more pronounced for apartments. The cause for this may be that the range in the value of apartments is not as wide as for homes. Housing consumption preference, measured by (M/Y), is quite uniform in all the cities.

The income elasticity with respect to monthly payments (^bMY) is low: .43 for homes and .35 for apartments. The elasticity, however, is not constant for all income levels. It rises at first, reaches a peak at the middle income group, and drops drastically at high income levels (see Table IV-5). Also at high income levels, the elasticity is not significant.^b It is understandable that (^bMY) should fall since there is an upper limit of the mortgage loan. Schwabe's law may thus be institutionally determined.

Testing for income elasticity with respect to house value (${}^{b}VY$) instead of monthly payments, gave almost identical results for all the cities other than Caracas and Ciudad Guayana. For Caracas, the elasticity dropped from .53 to .31 (see Table IV-1). The coefficient is found in ${}^{b}Y$) when (I/P·L/V) is deleted.

^bNot significant as applied in this analysis, refers to a "t" value of the coefficient which does not fall within the 95 percent confidence intervals.

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	Total		E	•	Homes		Cara-	Mara-	Valen-	Barqui-	Cludad
	Sample		01	LAL Samp	l I		cas	calbo	cia	simeto	Guayana
Monthly Income Range		0- 1500	1501- 2000	2001- 3000	3001- 4000	4001- above					
Sample Size	06	52	02	70	74	104	50	139	11	٤٤.	50 .
^b x'Y' logX'=F(logY')	.65 (.07) R ² =.54	1.49 (.11) R ² =.71	1.65 (.32) R ² =.36	2.02 (.24) R ² =.50	2.06 (.36) R ² =.31	.63 (.12) R ² =.20	.72 (.08) R ² =.64	.64 (.04) R ² 65	.64 (.07) R ² =.52	.60 (.06) R ² =.51	.68 (.11) R ² =.47
b _{NY} logM=F(logY)	.43 (.05) R ² =.45	.85 (.17) R ² =.26	.38 (.35) not signf.	1.18 (.28) R ² =.20	.17 (.36) not signf.	.16 (.08) not signf.	.53 .05) R ² =.69	.53 (.03) R ² =.61	.56 .06) R ² =.52	.54 (.06) R ² =.47	.72 (.11) R ² =.50
ь₁,,, logv=F(log,,')	.98 (.01) R ² =.99	1.02 (.03) R ² =.95	.98 (.02) R ² =.97	1.00 (.01) R ² =.98	.96 (.02) R ² =.96	.98 (.01) R ² =.97	.97 (.02) R ² 98	.98 (.01) R ² =.98	.99 (.02) R ² =.95	1.04 (.01) R ² 99	1.04 (.04) R ² =.94
					Apartmen	lt 8					

Table of Regression Results With (M) and (V) as Dependent Variables and (Y) as Independent Variables for Total Sample, Income Groups and Cities by Type of Dwelling

Sample Size	230	80	06	95	100	82
b _{Y'Y} ' logY'=F(logY')	.40 (503)	.110 (.10)	1.20 (.25)	1.60 (.30)	1.40 (.20)	.25 (.12)
	R ² ≡.58	R ² =.74	R ² ≡.50	R ² =.45	r ² =.60	R ² =.10
b _{NY} log ^{N=F} (logY)	.35 (.03)	.75 (.20)	.74 (.15)	.92 (.40)	.20 (.35)	.14 (.10)
	R ² =.41	R ² =.45	R ² =.35	R ² =.35	signf.	signf.

TABLE IV-5 (continued)

- variable has a letter which is used as a sub-script of "b". The index of variables was given in Appendix A of Chapter III. In case of coefficients which give elasticity values directly, Each independent the sub-script is formed by two letters. The first letter indicates the dependent variable, the second the independent variable, e.g., b_{XY} =elasticity of income with respect to rent. The symbol "b" denotes the coefficient values of the independent variables. a) Notes:
- The number in parentheses under the coefficient value gives the standard error of the corresponding coefficient. Ģ
- " \mathbb{R}^2 " refers to the coefficient of determination and is an indicator of the goodness of fit of the regression. A perfect fit would correspond to a value of \mathbb{R}^{2} =1.0. ିତ
- the groups in the data. I programmed a sampling routine used by the computer to sample randomly The sample sizes used in all the regression analyses do not correspond to the actual size of a specific percentage of the universe. This technique saves computer time. P
- "Log" indicates natural logarithm of, and "F" function of. () ()

As mentioned in the previous chapter, adjusted monthly payments are a more accurate measure of actual housing expenditure. This variable includes monthly payments as well as interest paid, or foregone, on the downpayment ($M^* =$ M + .008 D). When allowing for this adjustment, the elasticity between total value and monthly payments (${}^{\rm b}VM^*$) is close to one for all income levels and the regression has an almost perfect fit (see Table IV-5).

The adjustment in income and monthly payments raises (M/Y) more for the rich than for the other income groups since (D/V) was higher for the rich (see Table IV-4). The change was also greater for Caracas than any other city (from .19 to .28).^C

The downpayment adjustment also raises the elasticity of income (^bMY) from .43 to .65 for homes, and from .35 to .40 for apartments. The raise is most noticeable at the Bs.3,000-4,000 income level (from .17 to 2.06 for homes and .20 to 1.40 for apartments). The increase in (\mathbb{R}^2) and the improvement in the significance of the coefficients is remarkable.

2) <u>Age (A)</u>

The average new mortgagor is young; 37.1 years for home purchasers and 34.6 for apartment purchasers (see Table IV-6). This supports the theory that although housing needs increase

^c44 percent of the applicant households in Caracas had incomes above Bs.4,000 and 14 percent above Bs.6,000. In the rest of the cities, the percentages were 17 percent and 3 percent respectively.

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Table of Averages of Income, House Value and Household Size According to Age Groups by Type of Dwelling

	Age	Percentage	Age Mean	Income	House Value	Members
Homes	0-29	17%	26.9	3,330	94,100	3.6
	30-35	31%	32.5	3,500	107,800	4.1
	36-40	23%	37.9	3,790	117,200	4.9
	41 +	29%	47.4	3,550	116,900	5.2
Apartments	0-29	34%	26.1	3,200	81,800	2.9
	30-35	26%	32.1	3,110	86,000	3.5
	36-40	18%	37.8	3,150	87,000	4.0
	+ 17	22%	48.3	3,190	87,600	4.1
-	Mean age	e - homes	37.1			
	Mean age	e – apartments	34.6			

most markedly during the earliest stage of the family cycle, home purchases are made at a later stage. Even though the income variations with respect to age are small, they follow the expected pattern for homes. In the case of apartments, income is almost uniform with the peak at the youngest age group. Yet this group buys the lowest valued apartments, which would be an indication of the temporary status as apartment owners. Dwelling value steadily increases with (A).

It is interesting to note that average household size is largest for the oldest age group. This may point to the fact that extended family living is more prevalent in Venezuela.

The regression analysis confirms the cross-tabulation results. The elasticity of age with respect to house value is only significant for homes at a 7 percent level of significance (${}^{\rm b}VA = .18$). When mortgagors are partitioned into four age groups with a dummy variable assigned to each group, A2 (36-40 years) and A3 (41 + years) prove to be significantly different from A0 (0-29 years). The intercept increases by Bs.19,000 for A2 and Bs.13,072 for A3. In the case of apartments none of the coefficients are significant (see Table IV-7).

3) Household Size (N)

Tables IV-2 and IV-3 indicate that rich households are larger than low-middle or middle income households. (N) is positively correlated with monthly payments and total value.

(1)	Table of F , (N), (S), (A) a	kegression ind (0) as	Results wit Independent	ch (V) as I : Variables)ependent s by Type	Variable of Dwell	and ing for C	aracas		
Regression		Sample Size	a;	ΡÅ	N P	b _{A2}	b _{A3}	5 q	Ą	R ²
	Homes	238	71,150.9	12.5 (1.70)	4341 (2054)	19,566 (8570)	13,072 (7142)			.25
V=F(Y,N,S,A1,A2,A3,01,	02)			R ² .07	R ² .23	R ² .23	R ² .23			
	Apartments	220	63,140.2	6.3 (.80)						.25
	Нопея	238	3.11	.05)	.12 (.05)			06 (.03)	.18 (.10)	.35
				R ² .07	$R_{d}^{2}.33$			$R_{d}^{2}.33$	$R_d^2.33$	
logV=F(logY,logA,logN,	S) Apartments	220	3.75	(70°)						.29
Note: "R ² indicat is ^d indicat which stri ficients a value (inte	tes the "R ² " of t ed because the pu ng of variables c re not included i ercept) of the re	he total r rpose of t ombined gi n the tabl gression.	egression w he thesis i ves the hig es (the cel	hen the sp s to test hest "R2". ls are lef	ecific v the infl For th t blank)	ariable 1 uence of e same re . The he	s deleted specific ason "not ading "a"	. The v variable signifi refers	alue of s and no cant" co to the c	"R ² t d ef- onstant
Key: a) AO = (Al = 3(A2 = 3(A3 = 4)	0-29 years 0-35 " 5-40 " 1 + "	b) 00 01 = 00 02 = 02	All other Managers, F Unskilled I	rofessiona abor, Publ	ils and T itc Employ	echnician yees and	s Housewíve:	co.		

S = 0 if male S = 1 if female

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TABLE IV-7
Understandably, apartment owners have on the average smaller families at all income levels and for all cities.

I performed regressions of (N) and other explanatory variables with respect to monthly payments (adjusted and unadjusted) and total value (see Tables IV-7 and IV-8). In no case is (N) significant except for homes in Caracas where the elasticity (^bVN) is .12. The fit of the regression, in this case, is very low ($R^2 = .07$).

A semi-log regression of the form M = F (logN) does not improve either the fit of the regression or the significance of the coefficient of (N).

4) <u>Ser (S)</u>

Female household heads represent 15.5 percent of the sample. They tend to be younger and have lower incomes than male heads (27.9 percent of female heads had incomes above Bs.3,000 as compared to 47.5 percent for male heads) (see Table IV-9).

Contrary to my hypothesis, in the regression analysis (S) is highly insignificant except for the regression of (S) with respect to home values (see Tables IV-7 and IV-8). The coefficient sign is negative in all cases (i.e., the value of the intercept is lower when S=1) which indicates that females have lower levels of housing consumption. Given the correlation between income and sex (.34) the difference is more likely due to lower incomes than to housing preferences, although the latter possibility is not precluded.

TABLE IV-8

Table of Regression Results with (M) as Dependent Variable and (Y), (L/V), (P), (N) and (S) as Independent Variables by Type of Dwelling

Regression		Sample Size	¢	⁴ ۲,۲ [,]	۹ ^ل ر۷	р Р	R ²
MEF(V I /U P N C)	Homes	220	1140.5	.036 (.006) R ² .38	-586.5 (81.8) R ² .32	723 (.370) R ² .44	. 47
	Apartments	230	663.0	.018 (.003) R ² .04	-173.3 (96.8) R ² .15	420 (.21) R ² .17	.18
M'_F/V' B Y C)	Homes	220	2543.4	.061 (10.)			.45
(C(4,3, 1)] - 1	Apartments	230	1547.0	.028 (.005)			.22
log %=F(logY,logL/V,	Homes	220	2.2	.40 (.04) R ² .24	30 (.08) R ² .46		.50
logP, logN, S)	Apartments	230	2.2	.35 (.033) R ² .10	29 (.10) R ² .39		.41
logM'=F(logY',logP,	Homes	220	1.2	.44		35* (.21) R <mark>2</mark> .70	
logN,S)	Apartments	230	1.5	.38 (.03)			44.

* Significant only at 10 percent level of significance.

- Note: In the regressions where the values of (M) and (Y) are adjusted for the downpayment, (L/V) is not included as an explanatory variable since its influence is already expressed in (M') and (Y').
- S = 0 if head of household is male S = 1 if head of household is female Key:

TABLE IV-9

Distribution in Percentages of Mortgage Applicants by Sex According to Age and Income

			Income		
Ser	0-1499	<u>1500-1999</u>	2000-2999	3000-3999	<u>4000 +</u>
Male	3.8	14.1	33. 6	23.9	24.6
Female	13.9	23.5	34.7	17.7	10.2

Ser	<u>0-24</u>	<u>25-34</u>	<u>34-50</u>	<u>50 +</u>
Male	5.9	44.6	41.5	8.0
Female	9.2	45.6	37.1	8.1

TOTAL Males 85.5% Females 15.5%

5) Credit Terms (D), (P), (I)

The analysis tests for the influence of down payment (D) and the amortization period (P) on (M) and (V).^d In the previous analysis (D) proved to be an important variable in adjusting (M) and (Y) upward. In the regressions performed in this chapter, (D), in its inverse form (L/V), appears to be a highly significant explanatory variable (see Table IV-8). In one regression, where the normal functional form is used with the sample of home mortgages, when (L/V) is deleted the

^dThe limits of the savings and loan associations on the size of the loan and the maturity period reduce the representativeness of the data with respect to credit terms. Nevertheless, the competition from mortgage banks, insurance companies, and commercial banks provides alternatives of financing to high income mortgagors who are most affected by the limits.

value of $(R^2$ falls by more, $(R_d^2=.32)$, than when (Y) is deleted $(R_d^2=.38)$. Yet, applying the sample of apartment mortgages the combined effect of (Y) and both credit terms explains only 18 percent of the deviation of (M) around its mean.

The negative sign of (L/V) indicates a direct relationship between downpayment ability and housing expenditure (i.e., the larger the loan with respect to total value the lower the monthly payments). The elasticity is -.30 (R^2 =.50) for homes and -.29 (R^2 =.41) for apartments.

The availability of secondary mortgage funds is important in determining the downpayment capacity of the buyers. Table IV-10 indicates that a large share of the downpayment is funded through second mortgage loans, but there is no important correlation between (D) and second mortgage loans.

TABLE IV-10

Origin of Downpayment Fund Resources According to Size of Downpayment

Downpayment	Sample%	Savings%	Second Mortgage%
0-20,000	39	68.5	31.5
21-40,000	32	52.0	48.0
41-60,000	17	60.0	40.0
61-80,000	8	56.0	44.0
81,000 +	4	59.0	41.0

The maturity period also has a negative sign. The "t" values of (P) are much smaller than those of (L/V). It fails

to be significant in five out of the eight regressions performed. The elasticity (${}^{b}M^{*}P$) is the same as that for (${}^{b}ML/V$).

It would appear that this variable, like downpayment, might also be institutionally determined. Yet, the variation in the upper limits on (P) of mortgage loans given by the savings and loan associations for different house values is not sufficient as to make the institutional element dominant. In fact, many of the mortgage applicants chose amortization periods below the maximum eligible.

In an attempt to test for a general credit terms elasticity, I combined the three credit conditions into one composite "terms of credit" variable $(I/P \cdot L/V)$. [2] A rise in the interest rate (I) will raise the value of this variable, while an increase in either (P) or (L/V) will decrease it.⁶ Hence, the higher this index the tighter are credit terms and vice versa. Table IV-11 presents the results. The sign of the credit terms variable is positive, which is consistent with the negative sign of (P) and (L/V).

The regressions are run using the total sample and a different sample with constant structural area per member. Keeping (a) and (N) constant did not improve the results over the total sample except for the regression on Caracas and $180-210m^2$. Similar to (L/V), the credit terms variable

^e(I) is computed by adding the interest equivalent of insurance fees to the basic interest (7 percent).

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Table of Regression Results with (V) as Dependent Variable and (Y) and Terms of Credit as Independent Variables for Caracas and Other Cities (Combined)

				logV = P(log	Y, log $\frac{1}{P \times L/V}$	
-	. Sample .		Åq .	(deleting I	, b. /	-
	Size	¢	Å	~ P·L/	۸) T-۹ /۲ (۷	R ²
Caracas						
Total Sample	50	5.1	.26 (.09)	.31 (.09)	.69 (.14)	.46
			$\mathbf{R}_{\mathrm{d}}^{2}.38$		ب R <mark>d</mark> .36	1
N = 4-5	52	4.3	.35 (.09)	.29 (.09)	.28 (.11)	.26
a = 140-170			Rd. 08		R ² .17	
N = 4-5	50	6.0		.23 (.10) °	.76 (.16)	.52
a = 180-210			-		R ² .13	
All Other						
Total Sample	252	4.1	.44 (*04)	.53 (.04)	.50 (.0 9)	.44
			Rd.17		R ² .37	
N = 4-5 a = 110-140	86	3.9	.32 . (.06)	.32 (.06) °	5	.28
N = 4-5 a = 170-200	20	4.7	.19 (.08)	.20 . (.07)		.17

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is highly significant and in two regressions it increases the value of (\mathbb{R}^2) by more than (Y).

6) Occupation (0)

This variable is not at all significant when applied as a dummy variable at three levels in the regression with respect to (V) (see Table IV-7).

7) Other Variables

The quality of a house is determined by the value of the structure (S_t) and of land (T). Quantity of housing, in turn, is measured by the area of the structure (a) and of land (A_r) . And finally, the number of rooms per household member (R/N) determines the level of crowding. The following analysis studies the correlation between these housing components and (M) and (V).

The first consideration is whether spending on structure rises faster than spending on land. In the computations, $({}^{b}SV)$ is less than one for almost all cases (see Table IV-12). This is an indication that as house values rise, a larger share of housing consumption is directed towards land. In the regression of (S_{t}) with adjusted income, we see again that the elasticity for the total sample is below one, although not so for different income groups (see Table IV-12). Notice that the (R^{2}) for $({}^{b}S_{t}Y)$ is much lower than that for $({}^{b}S_{t}V)$.

The Table of Ratios also indicates that the share of land (T/V) increases with income. Caracas and Valencia, which face the greatest shortage of land, have the highest

				Total	Sample						
ena. 1 la 1 pg	Total Sample	0-	1501- 2000	2001- 3000	3001-	4001- above	Cara- cas	Mara- caibo	Valen- cia	Barqui- simeto	cd. Guayana
Sample Size	06	75	70	70	74	104	50	139	71	73	50
bs _t v	.81 (.03)	.86 (.04)	.82 (.07)	.78 (.07)	.80 (.05)	.79 (.05)	.80 (.06)	.98 (.01)	.96 (.03)	1.02 (.03)	1.01 (.06)
(ASOT) 1=1 cSOT	R ⁴ =.86	R ⁴ =.86	R ⁴ =,73	R ² =.62	R ⁴ =.72	R ⁴ =.69	R ⁴ =,78	R ⁴ =.95	R ⁴ =.91	R ⁴ =.94	R ² =.88
bewi	.50	1.23	1.49	1.70	1.55	.47	.51	.61	.55	.64	.83
oti	(90.)	(.14)	(.32)	(.28)	(.36)	(.12)	(60.)	(*0*)	(80.)	(.07)	(.12)
<pre>logSt =F(logY')</pre>	R ² =.44	R ² =.51	R ² =.31	R ² =.35	R ² =.21	R ² =.12	R ² =.40	R ² =.59	R ² =.36	R ² =.48	R ² =.52

TABLE IV-12

Table of Regression Results with $\left(S_{\xi}\right)$ as Dependent Variable and (V) and (Y') as Independent Variables for Homes by Income Group and City

land prices (T/A_r) . The difference in the price of land is so marked, that home owners in Caracas and Valencia are forced to buy smaller land areas despite their larger absolute (T/V)and relative (T/A_r) expenditure on land.^f Mortgagors in Caracas and Valencia also pay more for a structure of given size (S_t/a) (see Table IV-13). This could be attributed to the difference in costs which have been consistently higher in these cities.

Comparisons between apartments and homes with respect to structural cost are difficult, since the value of land is included in the price of apartments. This difference alone, however, cannot account for the large discrepancy in (S_t/a) between homes and apartments.

In no case is there overcrowding but it is surprising, that for homes, the number of rooms per member (R/N) falls as incomes rise. Yet, (A) and (a) increase with income for constant (N). The assumption is that increases in housing consumption take the form of larger rooms per member. I perform a simple regression of (a) with respect to (N) to test for this assumption (see Table IV-14). Three regression forms are used: normal, double-log and semi-log, for total sample, homes and apartments. As expected, (N) is only significant for homes. The low values of the coefficients show that changes in the area of the structure are

^fThe fact that land price, for the same city, increases with income is an indication that rich people do not move to the suburbs, where land prices are lower, but rather to higher income residential areas within the city.

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Ratios of Means of Housing Characteristics by Income Groups, Cities and Type of Dwelling

			Total Sample	0- 1500	1501- 2000	2001- 3000	3001- 4000	4001- above	Cara- cas	Mara- caibo	Valen- cia	Barqui- simeto	Cd. Guayana	All Other
KVN Apartments .82 .67 .74 .89 .87 .81 .30 .397 .390 .397 .390 .397 .390 .397 .390 .397 .390 .397 .390 .391 .390 .391 .390 .391 .390 .391 .390 .391 .390 .391 .390 .391 .390 .391 .390 .391 .390 .391 .391 .391 .301 .41 <th></th> <th>Homes</th> <th>1.05</th> <th>1.18</th> <th>1.14</th> <th>1.07</th> <th>1.00</th> <th>.98</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>		Homes	1.05	1.18	1.14	1.07	1.00	.98						
^L Homes 431 342 382 418 439 463 501 405 431 380 397 390 ^L / _A Apartments 854 818 802 859 860 887 876 585 631 655 T/A _r Homes 55 32 34 44 64 73 100 38 60 27 32 32 T/V Homes .26 .23 .23 .26 .28 .31 .27 .32 .32 34 .26 .28 .31 .23 .23 .26 .28 .28 .28 .28 .28 .28 .23 .23 .23 .23 .23 .23 .23 .23 .23 .23 .23 .23 .23 .23 .23 .23 .24 .18 .23 .23 .23 .23 .23 .23 .23 .23 .23 .24 .18 .23 </th <th>K/N</th> <th>Apartments</th> <th>.82</th> <th>.67</th> <th>.74</th> <th>. 89</th> <th>.89</th> <th>.87</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	K/N	Apartments	.82	.67	.74	. 89	.89	.87						
⁵ t ^{/a} Apartments 854 818 802 859 860 887 876 586 565 631 655 T/Ar Homes 55 32 34 44 64 73 100 38 60 27 32 32 T/V Homes .26 .23 .23 .26 .28 .31 .22 .23 .20	-	Homes	431	342	382	418	439	463	501	405	431	380	397	390
T/Ar Homes 55 32 34 44 64 73 100 38 60 27 32 32 T/V Homes .26 .23 .26 .23 .26 .28 .31 .22 .23 .20	st/a	Apartments	854	818	802	859	860	887	876	586		565	631	655
T/V Homes .26 .24 .22 .23 .26 .28 .31 .22 .24 .18 .23 .20	T/A _r	Homes	55	32	34	44	64	73	100	38	60	27	32	32
	T/V	Homes	.26	.24	.22	.23	.26	.28	.31	.22	.24	.18	.23	.20

		3					4 5 5			
	•		a≡F(N)	-	, 1og	a=F(logN)	-	ίο	a=F(logN)	
	Sample Size	Ø	Nq	R ²	¢	Р ^И q	R ²	g	$^{ m N}$ q	R ²
Total Sample	232	161.1	3.8 (2.5)*	.010	2.2	.03 (.02)*	. 005	161.2	12.16 (9.6)*	.007
<u>Homes</u> Value: 35,000- 150,000	206	152.7	1.3 (2.4)*	100.	2.2	.001 (.02)*	000.	150.7	5.5 (8.8)*	.002
Value: 151,000- and more	170	212.1	8.3 (4.0) *	.025	2.3	.07 (.03)*	.032	196.1	37.1 (17.3)*	.026
Apartments										
Value: 20,000- 110,000	218	130.6	2.5 (1.4)*	.015	2.1	.03 (.01)*	.017	127.3	10.7 (4.9)	.021
Value: 111,000- and more	175	208.6	9.5 (2.4)	060.	2.3	.06 (.01)	.070	206.2	31.9	.065

Table IV-14Table of Regression Results with (a) as Dependent Variable and (N) asIndependent Variable for Different Home Values by Type of Dwelling

* These coefficients are not significant at the 10 percent level of significance.

only slightly determined by changes in the household size. Although the fit of the regression is low, it is better for the sample with high home values than for low ones.

The Employment Multiplier (E)

Venezuelan policy makers are faced with the task of reducing the level of unemployment. The question they pose is: What type of investment and at what level will it create most jobs? To help answer this question, I measure the employment generation of investment in housing by income group and city.

Employment may be raised by making construction techniques more labor-intensive or by increasing the volume of construction. This study centers on the latter. More investment in housing can be stimulated by: a) making mortgage funds more accessible and cheaper, through better oredit terms, or b) increasing the payment capacity of mortgagors, through tax cuts or direct subsidies. Both policies can be interpreted by the mortgagors as an increase in income. If this income is treated as normal income, the effect it will have on employment creation from the increase in housing expenditure is determined by the multiplier.

The analytical framework used to determine (E) is the same as that developed by Strassmann. "The criterion for choosing an income group as most employment generating in housing should be a relation of the labor content of the house to income (L/Y)." [3] Based on this assumption the employment multiplier, related to a change in income, is:

(1)
$$E = b_{T,Y}(L/Y)$$

where (2) $b_{LY} = b_{MY} \cdot b_{VM} \cdot b_{SV} \cdot b_{LS}$ and (3) $L/Y = M/Y \cdot V/M \cdot S/V \cdot L/S$

This chain of products shows that the ultimate change in employment cannot be determined by one parameter alone but only through the combined interaction of several parameters.

To note the types of homes bought by different income groups, and then encourage construction of the type which has the highest labor content per bolivar of structural cost (L/S_t) is not sufficient. The final effect on (E) will be modified by the share of income spent on housing (M/Y), the preference for expenditure on the structure as compared to land (L/V), and the length of the maturity period chosen which affects (V/M).^g (See Equation 3.)

Similarly, the percentage change in employment is related to the percentage change in income through four elasticities (see Equation 2). If the ratios, or relative changes, are the same for all income groups, the employment multiplier is determined only by the elasticity chain (b_{LY}) . Since the ratios most likely differ, the employment multiplier is the product of Equations 2 and 3.

Given that there is no available information in Venezuela on some of the parameters, the values for (L/S_{\pm}) and $({}^{b}LS_{\pm})$

^gDifferences in downpayment to value ratios have already been considered by using adjusted monthly payments (M') and adjusted incomes (Y') in the calculations.

are taken from statistical calculations made in Mexico for several representative types of housing. [4] The types are: normal, average, average-good, good, and luxurious. By comparing the income ranges of the purchases of each of these house types in Mexico, with the income groups of the mortgagors of the savings and loan associations, I distribute the labor content per thousand square meters of structure as indicated in Table IV-15. Normal and average types are excluded because they are inferior to those purchased by the Venezuelan savings and loan mortgagors. Total employment refers to employment on-site and in the construction materials industry, while direct employment only refers to on-site labor. No distinction is made between skilled and unskilled labor. My concern is only with total number of workers.

TABLE IV-15

Total and Direct Employment Creation in the Construction of Housing Units by Type of Dwelling

Housing Type	$\frac{\text{Total}}{(L/1000m^2)}$	Direct ₂ (L/1000m ²)	Income Group
Average-Good	20.45	12.97	0-1500
Good	23.51	14.54	1501-4000
Luxury	29.48	16.16	4001 +

bLSt = .81 for total employment bLSt = .57 for direct employment

I assume these elasticity values to be the same for all three dwelling types. The employment multiplier calculations and results are presented in Table IV-16. The number of man-years per dwelling was determined by applying the figures of $(L/1000m^2)$ in Table IV-15 to a weighted average of the structural areas of each income group.

The results indicate that policy makers should give priority and incentives to the construction of housing for low-income groups (Bs.0-1500) and to middle-income groups (Bs.2001-3000) outside Caracas. Notice that the labor content per Bs.10,000 of structural investment is greatest for the type of housing built by the highest income group. Yet, the low-income elasticity with respect to housing of this group, and their higher preference for land, more than offsets the high (L/S_t) ratio.^h These results are only tentative until values of (L/S_t) and $({}^{b}LS_t)$ are calculated for Venezuela.

Summary

Income, as expected, is the most important determinant of demand for housing. Housing with respect to current income appears to be an inferior good $(b_{my} < 1)$ except for the middle-income group. Adjusting income and monthly payments upward by the opportunity cost of the downpayment, however, raises all the elasticities above 1 except for the highest

^hA low income elasticity implies that any increase will lead to a much smaller percentage increase in housing expenditure. A high preference for land, on the other hand, indicates that of the increased expenditure on housing a large share will not go to buy more structure, which creates employment, but to buy more land.

		Total	0-1500	1501- 2000	2001- 3000	3001- 4000	4001- above	Cara- cas	Mara- caibo	Valen- cía	Barqui- simeto	C1udad Guayana
Man-years dwelling (L)	Total Direct	4 .53 2.70	2.35 1.50	3.31 2.05	3.97 2.46	4.65 2.88	6.66 3.65	4.77 2.85	3.68 2.20	4.28 2.55	4.95 2.95	3.88 2.32
Ratio Chain												
L/S × 10 ⁻⁴	Total Direct	.58 .34	.60 .38	.61 .38	.35	.54	.64	. 30	.61 .36	.58 .34	. 65	.63
$S/Y' = \frac{M'}{Y'} \cdot \frac{V}{M'}$	s ⊳	20.88	29.20	27.03	25.23	22.24	16.42	21.29	18.67	23.00	21.47	21.65
$L/Y' = \frac{S}{Y} \cdot \cdot \frac{L}{S}$	Total Direct	12.11 7.01	17.52 11.09	16.49 10.27	14.13 8.83	12.01 7.34	10.51 5.75	10.64 6.39	11.39 6.72	13. 34 7.82	13.96 8.37	13.65 8.01
Elasticity Chain												
^b sy' ^{=b} m'y' ^b vm'	bsv	.52	1.31	1.33	1.58	.49	.56	.61	.61	.64	.64	17.
b _{ly} ,=b _{sy} ,b _{ls}	Total Direct	.42	1.06 .75	1.08 .75	1.28 .90	1.28 .90	.40	.45	.50	.50	.52 .36	.58 .41
Employment Multi	plier											
E'=b _{ly} ,(L/Y')	Total Direct	5.09 2.10	18.57 8.32	17.81 7.70	18.09 7.95	15.37 6.60	4.20 1.61	4.78 2.05	5.70 2.35	6.67 2.73	7.26 3.01	7.92 3.28

Employment Multipliers (E' per $Bs.10^4$) for Type of Housing by Income Group and Cities

TABLE IV-16

income group. Given that I consider the adjusted variable more realistic, it appears to be that housing is a luxury good for low and middle income groups.

Age of the household head is significant when divided into age groups and used as dummy variables, but only for homes. The assumption of non-linearity is confirmed.

The percentage of female household heads is lower than expected. As shown in the regression analysis, sex is not a significant explanatory variable. Still, the coefficient sign in almost every regression performed with (S) as a dummy variable (S=1 if female head) is negative. This points to a lower intercept of the regression, i.e., lower levels of housing consumption for female heads. Besides lower income levels, it could also be attributed to a lower propensity to incur debt due to job instability and other outside pressures.

Household size does not fall with income or age in Venezuela. This variable is not significant except in one regression. The fit of the regression, however, is very low and the elasticity small.

The most controversial result in the analysis is related to downpayment as an explanatory variable. Downpayment, as hypothesized, is more significant than the maturity period. The negative sign of the coefficient, however, shows that increases in housing consumption are associated with larger downpayments.

It appears to be, that this variable is institutionally determined. Consistent with Venezuelan housing policies, the downpayment requirements by mortgage institutions have been lowered more markedly for lower income groups. These groups also buy the lower priced homes. Mortgagors do not make large downpayments out of personal choice as is indicated by the almost uniform percentage of the downpayment they borrow from second mortgage institutions, irrespective of income level.

Most new house purchasers set maximum housing consumption standards by the percentage of income they are willing to spend on housing. As long as this accepted share of income is not surpassed, they will choose shorter maturity periods to reduce interest costs. The negative sign of the coefficient of amortization period in the analysis confirms that mortgagors look at the total interest cost and choose the alternative, within their budget, that minimizes this cost.

REFERENCES TO CHAPTER IV

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- Leo Grebler and Sherman J. Maisel, "Determinants of Residential Construction: A Review of Present Knowledge," in <u>Impact of Monetary Policy</u>, Commission on Money and Credit (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), p. 504.
- 3. Paul W. Strassmann, "Housing Finance and Employment in Latin America" in <u>Studies of Employment in the Mexican</u> <u>Housing Industry</u> (Paris: OECD, forthcoming).
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CHAPTER V

DEMAND FOR HOUSING:

ANALYSIS OF RENTERS AND MORTGAGED OWNERS

In this chapter I analyze the demand for housing of renters and mortgagors. Housing consumption is expressed in monetary terms through current expenditure. As was stressed in Chapter III, rent reflects more closely desired consumption level of housing services than monthly payments. Renters move more easily and adjust their level of consumption when the need arises. Home purchasers, however, move less frequently as a change in housing entails a large investment. The gap that often develops between actual and desired level of housing consumption, in particular for home owners, tends to be most pronounced at the early and the late stages of the life cycle.

In addition to tenure, renters and mortgagors, I used two other instrumental variables in the analysis: cities and urban sectors. Four cities have been chosen: Caracas, Valencia, Barquisimeto and Ciudad Guayana. They were selected on the basis of the differences in their socio-economic and geographic characteristics. These characteristics were described in Chapter I. One city which deserves special

attention is Ciudad Guayana. This city which was founded officially in 1961 and is to become the center of heavy industry in Venezuela, was built in an attempt to decentralize the economy by developing new poles of growth. The failure or success of this experiment will help solve the polemic between economic developers who support growth poles and those who oppose them.

There are two distinctly dissimilar urban sectors in most Venezuelan cities, the middle and high income residential areas, and the squatter settlements. For the greater part of the analysis these two groups have been analyzed separately as they form two separate housing markets. This is due to the peculiar characteristics of land tenure, the physical structure of the buildings, and the selling and buying process of housing units in the squatter settlements (barrios).

Barrios have been growing at a faster rate than conventional housing in most large Venezuelan cities. [1] The important role played by the barrios in the urbanization process of Venezuelan cities and the peculiarities of their formation and growth, demand an understanding of the squatter settlements and the people who live in them. In Appendix A I make a short appraisal of them.

Public housing is also analyzed as a separate urban sector. This type of housing is subsidized and subject to

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institutional credit terms and rent limits below those prevailing in the market. The results are likely to be distorted. Many households whose income has grown above the maximum amount for eligibility in public housing are hesitant to move. This is a reflection of the extent to which public housing units are subsidized. In my sample some of the households living in subsidized housing have incomes above Bs.5,000. In fact, more than 50 percent of all households in public housing had incomes above Bs.1,500.

The urban sectors are as follows: Zone 1 - squatter settlements (barrios or ranchos) Zone 2 - downtown areas Zone 3 - public housing Zones 4 and 5 - middle and high income residential areas.

Data Composition

The data used in this chapter are drawn from three sources: MERCAVI, University of Carabobo (U.C.) and Corporacion Venezolana de Guayana (C.V.G.). All three sets of information consist of cross-section data of household surveys taken between 1967 and 1970. MERCAVI's survey was directed specifically to study the housing market in Venezuela. The other two surveys, although containing some information on housing, were taken to collect data for studies on family budgets and cost of living indexes.

The bulk of the analysis is based on the data from MERCAVI. In addition to the information collected on the socio-economic and demographic characteristics of the housing consumer units, the survey also provided knowledge of the physical characteristics of the building and the public utilities available. This latter information was used by the surveyors to determine the percentage of adequate housing in each urban zone.^a Table V-1 shows some preliminary results. The disparity in the quality of housing between cities and Zones is pronounced. Note the large percentage of inadequate housing in Ciudad Guayana. This is an indication of the failure of the urban planners to cope with the high rate of growth of the city although the rate was lower than had been projected. The ability of the "rancho" dwellers to provide good shelter, through progressive investment, is reflected by the high percentage of adequate housing in Zone 1 in Caracas and Valencia. The ranchos in Ciudad Guayana, being more recent, are at the initial stages of transformation; therefore they are by and large still inadequate. Perhaps squatter settlers in Ciudad Guayana view their residence in the city as temporary and are not eager to invest much in housing.

^aThe quality of a dwelling is established according to the characteristics of the construction materials used and the public services available. Each characteristic is imputed a relative weight. The total sum of the weights is used to scale buildings on a quality basis. A scale of 100 corresponds to a unit that satisfies all the minimum quality specifications. A dwelling is considered inadequate if it accumulates less than 75 points. [2] The distribution in point weights imputed to each housing characteristic is given in Appendix B.

TABLE V-1

Percentage of Adequate Housing by Urban Zone, City and Tenure

		Zone 1			Zone 2			Cone 3			Zone 4	-	2	one 5			cone 6	
	A	8	υ	A I	8	υ	A	8	υ	A	8	υ	¥	8	υ	A	8	υ
Caracas	65.1	70.2	78.8	18.9	1.99	92.9	6.3	100.	100.	21.0	100.	100.	27.4	100.	8.66	37.0	78.4	92.5
Valencia	76.1	71.0	81.6	54.2	95.7	98.0	24.8	98.1	100.				19.8	100.	100.	56.3	81.7	6.46
Cd. Guayana	66.2	19.2	41.8	66.5	25.6	55.9	8.4	76.4	100.	35.4	44.2	86.1	5.8	100.	100.	45.6	28.7	79.3

Percentage of Inadequate Housing that Corresponds to Household Incomes Under Bs.1000

Cd. Guayana 76.1 Valencia 83.4 Caracas 73.8

Code: A - Percentage of Owners B - Percentage of Owners with Adequate Housing C - Percentage of Non-Owners with Adequate Housing

More than 70 percent of the inadequate housing corresponds to households with incomes under Bs.l,000/month (see Table V-1), which indicates the high correlation between income level and shelter quality. Low payment capacity of households due to low incomes, as was mentioned in Chapter II, is clearly one of the main reasons for the housing deficit in Venezuela.

A study of the public utilities (services) provided to the "barrios" shows the extent to which they have been integrated into the city. The high percentage of "ranchos" with electricity, water and street access in Caracas and Valencia is remarkable (see Table V-2). This points to the better living conditions of barrios in Venezuela than in other Latin American countries. Conditions in Ciudad Guayana again lag far behind Caracas and Valencia.

A large percentage of Venezuelans own their homes (see Table V-1). A closer look at the data, however, shows that home ownership, mortgaged or not, is very high for dwellers in Zones 1 and 2 but drops in Zones 4 and 5. This is understandable since barrio dwellers usually build and hence own their own homes, and there are few rental units available for other low-income groups.^b These groups are forced to

^bRenting ranchos is prohibited in certain municipalities. In Caracas there are signs warning squatter settlers against rent payments. The reason for this policy is probably to discourage speculation of land which is usually not owned by the landlord but was occupied during an invasion. Morally this is a good policy because it attempts to avoid the possibility of the barrio real estate market being controlled by

purchase their homes with funds from personal savings or private loans because they are not eligible for mortgage loans. There are few owners in Zone 3 since, until recently, the policy of the Banco Obrero was to rent its housing units.

TABLE V-2

Percentage of Slum Dwellings (Zone 1) With Inadequate Services According to Type of Service and City

	Street	Water	Toilet Facilities	G arbage Pick-up	Blec- tricity
Caracas	24.4	4.4	5.4	30.2	1.9
Valencia	0.0	19.3	5.4	25.8	1.9
Ciudad Guayana	.02	52.5	11.7	87.6	15.7

As in the previous chapter, odd cases are excluded from this analysis. This includes families living in rooms, units used for commercial purposes and those units given rent free to landlords (<u>conserjes</u>).

Housing Demand With Respect To:

1) Income (Y)

I apply three methods to test the effect of income (Y) on housing consumption (X). As was mentioned before, if there is one type of expenditure to which the "permanent

^b(continued) a group of absentee landlords that amassed large tracts of land during the invasion. From a practical point, the possibility of renting a rancho would temporarily help many new immigrants that came too late to find any open land available on which to build.

income hypothesis" is applicable, that is housing. Each of the methods used attempts to reduce the transitory component of income (Y_t) . The closer the income used in the regression is to normal income the better the coefficients will reflect the true relationship between (Y) and (X).

The methods are:

- A) inter-city comparisons: average values of (Y) and
 (X) for each city are applied in the regression.
- B) instrumental variables: tenure, city and urban zone; these variables stratify consumers into more homogeneous units.
- C) total expenditure as a proxy for income: empirical tests of consumption functions have shown that expenditure patterns are relatively stable. Families try to maintain a certain consumption level despite fluctuations in their income. Thus, total expenditure can be used as a proxy for normal income.

A) Several authors have pointed out that grouping families by city tends to cancel out below-normal and abovenormal incomes to approximately the same extent. Since (Y_t) is most important in below-normal and above-normal incomes, by cancelling each other out (Y_t) tends to have a zero mean. Hence, average current income for any city will closely reflect average normal income for that city.

I have calculated the weighted average of (Y) and (X) and their logarithms for 19 cities. The sample includes cities from almost every region in Venezuela. The difference in average (Y) between cities is substantial, ranging from Bs.924/month for Coro to Bs.2,272/month for Caracas. The disparity is more pronounced between high income families (Zone 5) (see Table V-3 in Appendix C). Applying these average values to the regression analysis gives a high elasticity of income with respect to (X) ($b_{XY} = 1.38$) and a good fit of the regression ($R^2 = .66$ and .78)(see Table V-4).

If there is a random measurement error of the explanatory variable, it will result in a bias of the coefficient. This is the problem of heteroskedasticity discussed earlier. The use of direct and reverse regression is a known technique used to reduce this bias. The two regressions, (Y) with respect to (X), and (X) with respect to (Y) set the limits within which the functional relationship of (Y) and (X) must fall. [3] In Table V-4, I give the results of the direct and inverse regression of $(\log Y)$ with respect to $(\log X)$. The two limits are (1.3) and (.48). 'The true elasticity $({}^{b}XY)$ lies somewhere between the two limits. Some authors have used the average of the two (.94) as the best estimate. [4]

Lee has criticized the use of average values for geographical areas such as cities. His argument is that:

"When individual observations are grouped according to measured housing consumption, the group average of measured housing consumption tends to be higher than that of permanent housing consumption at a high level of permanent housing consumption and lower at a low level of permanent housing consumption. In other words, a group

TABLE V-3

	Sample	Tot	tal	Zone		Zon	e 2	Zon	e G	Zone	e 4	201	le 5
City	Size	×	۲	×	Y	×	7	×	2	×	7	×	7
Cabimas	349	132	1362	083	0780	128	1156	159	1817			334	3871
Apure	158	154	1140	110	0822	238	1749						
Coro	307	101	0924	058	0576	119	66 60	112	1507			310	2 60
Barquisimeto	1092	127	1109	954	0634	177	1237	149	1422			261	2533
Maracaibo	1761	221	1813	107	1046	274	2096	164	1650	342	2234	576	3930
Cludad Guayana	834	150	1632	057	0861	660	1117	146	1726	132	1294	285	2926
Tucupita	134	115	1121	033	0475	153	1256	037	0884				
Cumana	423	154	1312	073	0420	221	1544	080	1019			465	3019
Maracay	375	236	1:97	163	1150	317	1753	147	1280			458	2330
Pto.Cabello	387	157	1138	112	0843	186	1109	119	2161			310	1893
Valencia	916	269	1942	133	1051	202	1617	176	1692			636	3720
V.Pascua	173	157	1341	122	8860	216	1864	072	0752				
D.Vargas	1014	241	1492	133	6003	303	1643	163	1346			598	3065
Barinas	326	137	1318	083	0881	239	1676	125	1769				
S.Cristobal	844	174	1325	116	0829	190	1429	146	1348			401	3008
Caracas	5440	398	2272	146	1092	375	2039	175	1632	612	3106	912	4539
Los Teques	375	236	1497	163	1150	317	1753	147	1280			458	2330
Merida	350	320	1788	222	1125	405	1987	143	1519			751	4847
Cd.Bolivar	439	163	1372	960	0856	167	1419	125	1228			254	1991

Average Housing Expenditure (X) and Household Income (Y) by City for 19 Cities

average of measured housing variables would overstate permanent housing consumption at a high level and understate it at a low level of permanent housing consumption." [5]

I correct this averaging problem by performing the regression for averages of each of the zones instead of using the original data of the total sample. Since permanent housing consumption and income levels tend to differ between zones, stratifying the data by zone avoids lumping high and low levels of housing consumption together.

The results in Table V-4 are consistent with those obtained in Chapter IV. Income elasticity increases up to the middle-income group (1.71) and drops drastically for the well-to-do (.76). The elasticity for Zone 3 is low, as expected, because of institutional constraints. The high proportion of the variation of (X) around its mean explained by (Y) is remarkable, particularly for Zones 3 and 5. The average of the direct and reverse regression coefficients gives a value of (^{b}XY) of around one for all zones.

I performed one further test and grouped the cities into low and high average incomes to reduce some of the differences in the levels of employment and economic activity between cities. Although values of (R^2) are substantially lower than those obtained from the aggregate sample, the elasticities of income are similar (see Table V-4).

B) Table V-5 shows that, as in Chapter IV, "Schwabe's Law" also holds true for the sample of the University of Carabobo. The same gradual fall in the share of income spent

TABLE V-4

Independent Variable for Average Values of Cities by Income Level and Zone Table of Regression Results With (X) as Dependent Variable and (Y) as

		TIA	Low Income	High Income				
Number of Cities		Sample 19	Sample 10	Sample 10	Zone 1 19	Zone 2 19	Zone 3 19	Zone 5 15
$b_{\rm Y}$ 1) X = F(Y)	R ²	.20 (.026) .78	.10 (.042) .41	.23 (.057) .67	.21 (.30) .74	.21 (.032) .72	.095 (.013) .77	.16 (.017) .83
b _{XY} 2) logX = F(logY)	R ²	1.38 (.242) .66	1.13 (.451) .44	1.20 (.582) .35	1.54 (.308) .60	1.71 (.33) .61	.68 (.040) .94	.76 (.025) .98
b _{YX} 3) logY = F(logX)	R ²	.48 (.084) .66	.39 (.155) .44	.29 (.140) .35	.39 (.077) .60	.36 (.069) .61	1.38 (.082) .94	1.30 (.043) .98
Гом Іпсоше	Cities	: Cabimas Apure Coro Barquis	imeto	-	ligh Income	Cities: 0	Cabimas Maracaibo Guayana Maracay	

In this chapter (X) is the symbol for housing expenditure irrespective of whether it refers to rent, monthly payments or imputed rent. Note:

Los Teques

Caracas Bolivar Merida

Pto.Cabello S.Cristobal

Tucupita V. Pascua Barinas Cumana

Valencia D.Vargas

on housing as income grows, although less pronounced, is seen in other tables computed for Barquisimeto and Caracas with MERCAVI data. This could be due to the understatement of the real housing expenditure reflected in mortgage payments when these are not adjusted for downpayment as was done in the previous chapter. Unfortunately, I have no information available on downpayments. Calculating the same table (Table V-5) using renters only, still indicates a fall in (B/A) when incomes rise, although not so pronounced as for the total sample.

TABLE V-5

Table of Averages on Percentage of Income Spent on Housing and Household Size for U.C. Sample by Income Range

Range	Number of House- holds	(A) Income	(B) Housing Expend.	Ratio B/A	Household Size
0-500	127	238	113	•47	5.8
501-1000	167	761	166	.22	6.3
1001-1500	54	1227	217	.18	5.5
1501-2000	30	1826	338	•19	5.1
2001-3000	28	2512	466	•19	5.0
3000 +	17	4648	712	.15	5.2

Valencia

Renters spend a larger share of their income on housing than do mortgaged owners. This difference would probably be reduced if (Y) and (X) of mortgaged owners were again adjusted upward by the downpayment. I used two functional forms to determine the relationship between (Y) and (X) of consumer units: a) double-log and b) second-order polinomial. The fit of the regression is better in almost all cases for (b) (see Table V-6). Thus, the relationship between (Y) and (X) is more likely nonlinear than linear. The marginal propensity to consume increases at first, reaches a peak and subsequently falls.

The elasticities are all below one and lower than those obtained with average values. The explanation lies in (Y_t) . Whereas (Y_t) tends to have a zero mean for each place, this is not true when the observations used refer to consumer units within a place. Instrumental variables are not as effective as average values in approximating normal income.

The elasticities of income are lower for Ciudad Guayana than for the rest of the cities. They also tend to be lower for mortgaged owners than for renters. The variation in (^{b}XY) between zones is not the same as was observed in the calculations with averages. No conclusion as to differences between zones can be reached other than that the R^2 are substantially lower for Zone 1 than Zones 4 or 5. This suggests that variables other than income are more important in explaining the level of housing consumption for the barries than residential areas.

In the regressions performed with the data from the University of Carabobo the elasticity of income with respect to imputed rent was similar to that with respect to imputed

	77	Caracas			Valenci	a		Cd. Guay	ana	Ŕ	arquisime	to
Sample	Sample Size	A) b _Y	B) b _Y b _Y 2	Sample	(A)	B) b _Y b _Y 2	Sample	A) b _Y	B) by by2	Sample Size	A) b _Y	B) by by2
Total Sample Mortg, Own	364	.69 (.04) R ² .40	.1809 (.01)(.01) R ² .40	108	.75 (.07) R ² .48	.1910 (.03)(.04) R ² .46	459	.39 (.03) R ² .26	.0803 (.01)(.01) R ² .29	292	.63 (.05) R ² .34	.06002 (.01)(.001) R ² .77
Total Sample Renters	312	.70 (.04) R ² .43	.1807 (.01)(.01) R ² .51	240	.73 (.05) R ² .45	1.810 (.02)(.04) R ² .46	288	.36 (.05) R ² .37	.0803 (.01)(.00) R ² .37	215	.68 (.06) R ² .45	.1106 (.01)(.01) R ² .44
Zone 1 Total Sample	250	.51 (.06) R ² .20	.1201 (.02)(.07) R ² .16	122	.53 (.10) R ² .20	.1220 (.04)(.10) R ² .20	107	.49 (.08) R ² .28	.08 .10 (.03)(.04) R ² .42	319	.39 (.04) R ² .20	.0506 (.01)(.02) R ² .25
Zone 3 Mortgaged Owners	221	.30 (.05) R ² .12	.0604 (.01)(.02) R ² .10	133	.13 (.04) R ² .06	.0202 (.01)(.02) R ² .03				220	.39 (.06) R ² .16	.0507 (.02)(.03) R ² .10
Zone 3 Renters	207	.46 (.07) R ² .17	.08 .06 (.02)(.05) R ² .17	41	.55 (.18) R ² .49	.2330 (.12)(.20) R ² .55				S	.32 (.08) R ² .25	.09 .10 (.03)(.07) R ² .32
Zones 4+5 Mortgaged Owners	213	.36 (.05) R ² .22	.06 .02 (.01)(.04) R ² .43	05	.39 (.13) R ² .18	1.910 (.07)(.06) R ² .20				45	.87 (.09) R ² .87	.13 .06 (.02)(.02) R ² .97
Zones 4+5 Renters	245	.64 (.04) R ² .57	.2209 (.02)(.01) R ² .53	116	.39 (.06) R ² .27	.1409 (.04)(.05) R ² .28				47	.63 (.09) R ² .54	.12 .06 (.02)(.02) R ² .59

Table of Regression Results with (X) as Dependent Variable and (Y) as Independent

TABLE V-6

B) $X = a + b_1 Y + b_2 Y^2 + E$

Note: In this table and in Table 7 the coefficient for $h_{\gamma 2}$ should be multiplied by 10^{-4} .

Regressions: A) $logX = a + b_l logY + E$

monthly payments (see Table V-7). Both are slightly higher than those obtained for mortgaged owners with MERCAVI data.

C) Using total expenditure as a proxy for normal income does not improve the fit of the regression nor increase (^bXY) above the results obtained in B) with MERCAVI data (see Table V-7). The only noticeable difference between both U.C. and C.V.G. data, and MERCAVI is in the ranchos. Both show a distinctive difference in (^bXY) between rancho dwellers and those living in conventional homes. (In the MERCAVI sample this difference was not consistent enough for all cities as to arrive to the same conclusion.) As in MERCAVI, (R^2) values are much lower for the barrios group. The second-order polinomial function again provides a better fit of the regression in the analysis of U.C. and C.V.G. data than does the double-log function.

Other Variables

The combined effect of the main explanatory variables in the model on (X) is measured in the following two regressions:

(1) $X = a + b_1 Y + b_2 E + b_3 N + b_4 A + b_5 S + b_6 H + E$ (2) $\log X = a + b_1 \log Y + b_2 \log E + b_3 SlobY + b_4 TlogY + b_5 S$ $+ b_6 H + E$

where S and T are dummy variables.^C

^CS=0 male heads H=0 households with only principal S=1 female heads families H=1 households with additional families. The significance of dummy variables can be measured either by the effect they have on the intercept of the regression
8 S	
(TEXP)	Type
is of Regression Results with (X) as Dependent Variable and (Y) or (T	Independent Variable for Ciudad Guayana and Valencia by Dwelling Ty
Tab	

Ciudad Guayana (CVG)

	logX=F(logY) by	4	.73 (.06)	R ² .42	.82 (.13)	R ² .41	.77	(.06) R ² .45	.30	(.11) 8 ² 11	77. W	.66 (.06)	R ² .45
.a (UC)	Sample	2770	187		57		170		67			163	
Valenci	a [ˈuˈəsə] ə	oampre	Imputed Imputed	kent	Monthly	rayments	Total Sample	(Imputed, Real or Monthly	raymentay	Rancho		Conventional	Housing
	X=F(TEXP. TEXP. ²) b _{texp} b _{texp} 2		.07 .09 (.05) (.13)	R ² .38	.05 .20 (.04) (.11)	r ² .39	.1344 / 04) / 22)	R ² .20	.06 .14 (.02) (.07)	к ² .39			
Guayana (CVG)	logX=F(logTEXP.) b _{reve}	1545.	.63 (.21)	R ² .27	.14)	R ² .36	.59	R ² .18	.73 (.17)	R ² .33			
Ciudad	Sample	2770	67		158		92		225				
			H Imputed) Rent or	Payments	Rent			Rancho	nventional	ousing			
			но: 000	- N F	U Z U				ပိ	Ho			

TABLE V-7

I performed these regressions for every city by tenure and urban zone. The results are given in Tables V-8 through V-15 of Appendix C.^d

Surprisingly, the combined effect of the independent variables explains, on the average, slightly less than 50 percent of the variation of (X) around its mean. (Y) is by far the most important variable. When deleted, (R^2) values fall on the average, by half. In addition, if (E) is deleted, there are only two regressions whose coefficient of determination remains above .10. The (R^2) values are highest for Zones 4-5 and usually lowest for Zone 1.

The effect of each explanatory variable, other than income, is discussed as follows:

2) Education (E)

Besides income, (E) is the only explanatory variable which is significant in almost every regression. The simple

^c(continued) or on its slope, or both. The previous dummy variables used have tested for shifts of the intercept. In regression (2) and in subsequent regressions I test for both the effect on (a) and on the coefficient of (Y).

e.g. if S=0 a=a S=1 a=a + b_5 $b_1=b_1$ $b_1=b_1 + b_3$

^dA few explanations are needed in order to interpret these tables: The value of R_d² (deleted) is placed only under the standard error of the (Y) coefficient because of its importance. If a coefficient is significant at a 5 percent level of significance, the space under the standard error is left blank. In case of higher percentage, the corresponding levels of significance are written. Other than in the regressions for the total sample, if a coefficient is significant only above 20 percent the coefficient and standard error values are omitted. correlation between (Y) and (E) is high but not enough to present problems of collinearity. (E), as mentioned above, is measured as a quantitative variable in terms of the number of years of schooling. The elasticity (^{b}XB) lies on the average around (.30). Morgan's quotation in Chapter III on the effect of (E) on (X) seems to hold true for my sample. In addition, education implies social class and a need to maintain a standard of living which is very closely related to residential status.^e

3) Household Size (N)

Tabulations of average household size by income show again that (N) is almost the same for the rich (5.8) as for the poor (5.9) and slightly smaller for the middle class (5.4).

With respect to housing there is no indication of a continuous function, linear or non-linear, between (N) and (X) or (X/Y), according to the results of Table V-16. In regression (1), (N) is significant only in five of the 31 regressions performed. Whenever significant, it is most significant for mortgaged owners and Valencia. Furthermore, the sign of the coefficient is inconclusive.

In order to test for the separate influence of (N) on (X) I calculated simple regressions in double-log, semi-log

^eMaria Garcia Velutini, in her study of mortgage applicants to one mortgage bank, found that families moved frequently, not because they desired larger or better homes, but because they wanted to live at "the proper address". Housing is one of the prime status symbols.

Ratio of Total Housing Related Exp. and Total Expen. Cd.Guayana	.25	.31	.23	.29	.24	.25	.32	.25	.24	.22	.19	.22	.22
of B/A Cd.Guay.	.16	.18	.11	.13	.12	.12	.11	.13	.13	.10	.11	60.	.13
Ratio Val.	.25	.22	.19	.21	.19	.20	.22	.14	.17	.21	.22	.23	.14
(B) ising iditure d.Guay.	129	155	123	163	124	122	133	143	147	107	132	97	84
Hou Expen	177	198	218	247	283	199	241	173	134	157	138	190	6
(A) pme or rpenditure Cd.Guayana	811	850	1155	1220	1012	686	1200	1127	1133	1113	1155	1026	647
Inco Inco Total Ey Valencia	703	886	1121	1156	1492	666	1086	1266	813	755	635	843	640
Household Members	1	2	£	4	5	6	7	80	6	10	11	12	13

Table of Averages of (X), (Y), (T EXP) and (X/Y,T EXP) with Increases in (N)

TABLE V-16

and quadratic (second order polinomial) forms (see Table V-17). The few results with significant coefficients correspond to mortgaged owners and have a negative sign which shows a negative correlation between (N) and (X).

When (N) is divided into groups and a dummy variable is applied to each group, the calculations did not indicate any significant difference between the groups. Applying the U.C. and C.V.G. data did not improve the results either (see Tables V-18 and V-19 in Appendix C).

4) Age of Head (A)

Income (or total expenditure) increases with (A) up to middle age and falls for the oldest age group. Nevertheless, in Table V-20 we see that the share of income spent on housing increases continually with (A). This is not surprising given that the data used (U.C. and C.V.G.) include imputed rent. Incomes of older people usually fall, but they do not tend to move once the house is paid for or fully built. This rationale, however, does not apply to renters.

Although more significant than (N), (A) is not as important an explanatory variable as I originally hypothesized. While significant for Caracas in regression 1, it is not so for any other city. As in the case of (N), I preferred to test for the individual influence of (A) on (X) using the same functional forms as for (N). Table V-21 shows the results. In those particular regressions (N) and (Y) are kept constant in order to better test for the individual influence of (A).

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TABLE V-17

Table of Regression Results with (X) as Dependent Variable and (N) as Independent Variable in Three Functional Forms for Four Cities by Tenure

	_		10 Youl	(Joek)	CUATA	1	_	<u>ч-г/и и²,</u>			- A	A-01/4	1 Vaci 18	W V. 100 V	104	
City	Sample	Sample Size	2 at	N. q	R ²	N A	R ²	Ng	b _N 2	•	R ²	blogY	bri logy	b _{N2} logY	PN1	ь _{й2}
じょえく	Mortgaged Owners	364	.02	26 (.09)	.01	-202.0 (93.3)	-04	-20.6 (30.4)	01 (2.3)	.36	.42	.65 (.06) R ² .20	.09 (.09) 30 2	.21 (.24) 39 2	39 (.31) 21 X	90 (.81) 27X
s A C S	Renters	312	.002	.07 (.08) 402	.007	106.1 (75.3) 16 2	10.	50.9 (25.4) 1:	-3.8 (2.0) 3 X	.33	.46	.67 (.05) R ² .17	.20 (.10)	.14 (.19) 47 2	75 (.36)	65 (.64) 31X
M L M A	Mortgaged Owners	108	.002	.08 (.17) 63 X	100.	32.1 (128.8) 80 2	100.	9.6 (44.0) 97	50 (3.2) /Z	37	s.	.84 (.12) R ² .24	13 (.17) 44 Z	19 (.21) 37 2	. 33 (.54) 55 X	.63 (.71) 38 2
NOHA	Renters	240	.002	.06 (.08) 512	.002	39.8 (61.5) 702	.01	-22.4 (19.5) 26	2.2 (1.5) 3 X	61.	.46	.69 (.06) R ² .15	14 (.12) 25 X	.03 (.36) 92Z	47 (.39) 24 X	03 (1.1) 98 X
19 4 1 10 1	Mortgaged Owners	292	.01	19 (.10) 8 2	.002	50.1 (61.6) 42 X	10.	29.1 (17.6) 2!	-1.9 (1.2) 5 X	.36	.35	.56 (.07) R _d .22	.10 (.10) 34 z	.15 (.18) 37 2	32 (.32) 33 X	62 (.54) 26 X
M H S H M	Renters	2.5	.003	.08 (.09) 40 Z	100.	3.2 (34.4) 92Z	.002	1.3 (11.4) 76	28 (.89) BX	03	. 46	.73 (.07) R ² .18	07 (.11) 48 Z	21 (.57) 27 2	. 18 (. 32) 57 X	57 (. 55) 30 X
ပင်ဖာ	Mortgaged Owners	459	.04	25 (.06)	.01	-67.1 (31.1)	.02	4.0 (9.6) 4 (74 (.65) DX	.81	.30	.43 (.04) R _d .14 ·	.02 (.07) 73 2	29 (.08)	12 (.21) 58 X	.76 (.25)
<≻< % <	Renters	288	100.	.04 (.08) 59Z	.00	26.2 (31.2) 41 Z	-007	16.3 (11.5) 34	-1.4 (.98) 41	.57	.33	.54 (.06) R ² .11	.11 (.12) 36 2	15 (.23) 53 X	42 (.37) 27 X	. 38 (69.) 592

TABLE V-20

Table of Averages of (X), (Y), (T EXP), (X/Y,T EXP) and (N) for Different Age Groups by City

ge ng e	(Inco Total Ex Valencia	A) me or penditure Cd.Guayana	Hou Expen	B) sing diture d.Guay.	Ratio Val. Co	of B/A d.Guay.	House S1 Val. C	hold ze d.Guay.
5	888	956	154	96	.17	.10	5.3	4.8
5	1160	1142	186	133	.16	.12	5.6	6.0
5	1148	1099	230	140	.20	.13	6.2	6.7
0	863	1088	226	149	.26	.14	6.3	6.7
	644	723	220	110	.34	.15	5.3	5.0

	11,A2	^b A2	
•	A3 10gY,/	^b A2 log1	
IS (Y) and (N)	(,A2 logY,/	^b Al logY	04
nd (A) a nstant (Al logy	b _{logY}	1.30
ble ar nd Cor	(logY	R ²	.08
nt Varia Cities a	logX=F	g	1.8
Depender r Four (- ~	b _A 2	15
(X) as forms fo	X=F(A,A	P ^A	11.3
s with ional 1	_	R ²	.03
ion Result: nree Funct:	(logA)	ь _A	-238.1
legress: e in Th	X=F	R ²	10.
ble of F Variabl	(logA)	P ^A	21
Ta	logX=F	R ²	.008
Inde	-	Sample Size	193

	•	logX=F((logA)	X=F(logA) I		X=F(A,A ²)	-	logX=F	(logY,	Al logY.	A2 logY,A	3 logY,A	(£4,54,1
City	Sample Size	R ²	P ^A	R ²	р ^у	R ² 1	P _A	b _A 2	a	R ² 1	^b logY ₁	^b Al logY	^b A2 10gY	b _{A2}
Caracas	193	.008	21 (.16) 21 Z	.01	-238.1 (167.5) 16 2	.03	11.3 (11.0) 1(15 (.12) 0 Z	1.8	.08	1.30 (.42)	04 (.03) 20 X		
Valencia	82	100.	.02 (.23) 45 X	.003	71.5 (149.4) 63 X	.006	6.1 (9.0) 3	06 (.09) LZ	1.1	.10	.41 (.44) 36 Z		1.18 (.73) 112	-3.8 (2.3) 11%
Barqui- simeto	67	.006	.17 (.26) 532	.02	138.1 (131.7) 29 2	.06	17.8 (8.8)	20 (.10) 6 Z	.33	.08	.60 (.47) 16Z			.09 (.07) 23 X
Ciudad Guayana	45	.060	68 (.98) 492	.06	-360.3 (508.0) 49 Z	.16	86.4 (105.0) 3:	-1.2 ['] (1.4) 1 X	-4.5	.65	2.16 (.65)		-1.71 (1.50) 30 2	5.48 . (5.08) 30 2

Constant: 1) Income (Bs. 2000-3000 for Caracas and Bs. 1300-2300 for all others) 2) <u>Household Size</u> (4-5)

AO = 25-40 years Al = 0-24 years A2 = 41-49 years A3 = 50 + years Key:

In the multiple regression, coefficients with "t" values above 30 percent confidence level are not included in the table. Note:

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TABLE V-21

The fit of the regression is higher for (A) as an independent variable than it is for (N), but still very low. The levels of significance (which indicate the probability of the results being simply random) are also too high to accept the coefficients as statistically meaningful. Since the coefficients of determination are highest and the levels of significance lowest applying the quadratic and semi-log form, the evidence points to a non-linear relationship between (A) and (X). Tests with U.C. and C.V.G. data show similar results (see Tables 18 and 19 in Appendix C).

5) <u>Ser (S)</u>

The following table gives the percentage of female household heads by urban zone.

TABLE V-22

Percentage of Female Household Heads by Urban Zone and City

			Zones			
	1	2	3	4	5	Total
Caracas	19.1	18.8	25.2	16.9	10.3	18.9
Valencia	20.7	27.9	16.6		5.9	17.7
Ciudad Guayana	17.0	16.4	8.0	16.3	7.8	14.5

The lowest percentage of female heads corresponds to Zone 5 in all three cities. The departure of the male member from the household is most common among poor people. It is not surprising to find a high percentage of female heads in Zone 3 in Caracas. The Banco Obrero has followed a policy of priority to female heads in its allocation of housing units. Ciudad Guayana has a lower percentage of females than the other cities probably due to the larger number of males migrating to the new city.

The coefficient of (S) is highly insignificant in almost every test of regressions (1) and (2). The sign of the coefficient, however, is negative in the more significant cases, both with respect to shifts of the regression intercept and changes in the slope of (logY). Hence, households with female heads seem to spend less on housing and have a lower elasticity of income (^{b}XY). This confirms the hypothesis that employment insecurity and social pressures make women more cautious with respect to the future. Their willingness to make large investments or commitments on monthly cash outlays is thus reduced.

6) Household Type (H)

In the description of MERCAVI's data in Chapter I, I mentioned the distinction made between principal and additional households (families). A household living under the same roof, formed by separate families (though usually related) may have different housing consumption patterns than one with the same (N) but composed only of the principal family. The members of additional families and their income might be viewed as being only temporary. They are called "additional" because they have expressed the desire to move as soon as conditions allow them to. Table V-23 shows that most households consist only of principal families. This does not preclude extended families. It only implies that in more than 90 percent of the cases, all members of a household have expressed desire to stay. There are a higher percentage of additional families in Caracas, probably because of the relatively greater need for doubling up given the higher cost of housing in this

city in relation to income.

TABLE V-23

A) Households According to Number of Principal and Additional Families Living Together in Percentage by City

	Principal Households Only	One Addi- tional	Two Addi- tional	Three and More Additional
Caracas	92.1	6.5	1.1	•3
Valencia	95.2	4.3	•4	.1
Cd.Guayana	95.9	3.7	•3	.1

B) Distribution of Additional Families According to Income Ranges in Percentage for Caraoas

		Incom	e Range		
0-500	501-1000	1001-1500	1501-2000	2001-3000	3000 +
32.6	41.0	14.0	5.1	4.8	2.5

Looking at the distribution of additional families according to income ranges strengthens the view of the importance of income in satisfying housing needs. 73.6 percent of additional families live in households whose total income is below Bs.1000/month. In the regression analysis consumer units with additional families do not differ statistically in their housing consumption from those composed only of principal families. As with sex of household head, however, the sign of the coefficients of (H) are negative for the coefficients modifying the intercept and ($^{\rm b}XY$). Thus, it seems that households with additional families not only tend to spend less on housing, but divert a smaller share of increases in income to housing consumption. The reason seems to be the temporariness of the income and the members of the additional families as it is viewed by the household head. He (she) is probably the person that makes the decisions on the budget share that will be spent on housing, and may prefer to crowd, given that it is only temporary.

7) Income Earners (BY)

The effect of the number of contributors to the household income on (X) is similar to that of additional families. It is assumed that, for a given income, the transitory component of income increases with (EY). Decisions on housing consumption are based mainly on the income of the main or more permanent earners. The income of additional earners tends to be spent on non-housing expenditures.

The results in Table V-24 (Appendix C) confirm this assumption. As (EY) increases from one to four for renters, the percentage of income spent on housing declines from .22 to .10 in Caracas and from .14 to .6 in Ciudad Guayana. It is similar for mortgaged owners. This decline in (X/Y) cannot be explained by differences in the size of the household because the analysis showed that (N) is not a significant variable.

8) <u>Rooms (R)</u>

The last chapter showed that as house values rise, a larger share of housing consumption is directed towards land. The quantity of space consumed, in terms of rooms per capita (R/N), remained almost constant as incomes r se, yet the elasticity (${}^{b}S_{t}Y^{*}$) was .50 for the total sample. Using MERCAVI's data I want to test again for changes in quantity of housing by measuring the effect of (Y) on (R) holding (N) constant (see Table V-25).

The results indicate that (R) varies significantly with changes in (Y) although not proportionally (the highest value of $({}^{b}RY)$ is .36). The fit of the regression for the barrios zone is low compared to that of residential areas. Nevertheless, it is clear that ranchos do not consist simply of single-room structures, but are improved into larger units with more rooms when incomes rise.

Preferences

Finally, I look briefly at the voiced preferences on housing of household heads, as they appeared in the questionnaires. Housing programs can fail unless they take into consideration the tastes and preferences of the people who

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Regression Table with (R) as Dependent Variable and (Y) as Independent Variable in Two Functional Forms for Three Cities by Zone with Constant Household Size (4-6)

	Samole	Zone	-1	Samule	Zones	4-5
City	Size	logR=P(logY)	R=P(logY)	Size	R=P(logY)	R=P(logY)
Caracas	279	.25 (.05)	1.69 (.30)	247	.24 (.03)	2.35 (.32)
		R ² =.09	R ² =.11		R ² =.20	R ² =.18
Valencia	62	.17 (.08)	1.54 (.79)	59	.36 (.07)	3.91 (.85)
		R ² =.06	R ² =.07		R ² =.27	R ² =.27
Barquisimeto	124	.22 (.06)	1.47 (.41)	142	.27 (.04)	2.82 (.50)
		R ² =.09	R ² =.10		R ² =.65	R ² =.63

Note: All the F-values of the regressions are significant.

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TABL	

Opinion of Household Head by City (Urban Zones 2-5)

Question: What Do You Feel to be the Share of Income You Spend on Housing?

Current Share of Income Spent		Caracas X		-	Valencia X		Clu	lad Guayan %		Bai	rquisimeto %	
on Housing	High	Adequate	Low	High	Adequate	Low	High	Adequate	Low	High	Adequate	Low
1-5%	2.0	21.1	76.9	1.6	17.4	81.0	8.1	52.7	39.2	3.9	70.4	25.7
6-10%	10.1	68.0	21.9	8.5	7.77	13.8	23.4	71.7	4.9	13.3	83.8	2.9
11-15%	20.4	65.4	14.2	25.0	70.4	4.6	33.1	64.9	2.0	43.6	55.6	0.8
16-20%	43.7	50.2	6.1	41.7	53.9	4.4	52.0	46.6	1.4	61.5	36.3	2.2
21-25%	46.6	51.4	2.0	43.4	55.3	1.3	55.9	44.1	0.0	53.9	46.1	0.0
26 + %	62.9	35.6	1.5	68.5	30.5	1.0	67.8	30.5	1.7	71.0	28.0	1.0
Total	31.0	48.6	20.4	26.7	49.1	24.2	30.7	58.7	10.6	36.1	57.0	6.9

	οnς Ουιε	stion: What	What i t is the	.s Your Maximu	Actual m Conti	Contrib cibution	ution t 1 You Cc	co Hous: ould Mal	ing and ke?	1		
				-	Carac Income 1	lange						
					(Bs./M	onth)						
Opinion	0-0-0	500 R	501- 0	.1000 R	1001-0	-1500 R	1501- 0	-2000 R	2001- 0	3000 R	0 300	+ ¤
Actual Contribution	140	120	155	160	165	250	250	325	375	400	670	650
Maximum Contribution	85	105	125	155	150	225	160	300	5.0	375	425	540
				Щ	larquist	meto					_	
Actual Contribution	20	85	6	130	110	175	135	180	140	190	170	350
Maximum Contribution	40	55	80	115	110	160	120	170	135	195	155	325
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TABLE V-27

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Owners Renters Key: 0 R

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Opinion of Household Head by City and Type of Dwelling

(A) In Which Part of the City Would You Prefer to Live?(B) Would You Like to Live in an Apartment? Questions:

u Lanaari.		Carac	385			Valen	cla			Cd. Gua	yana	
Used Two of		(Y)	Tndt f_	(B)	- made	(Y)	Tndif	(B)		« (¥)	Tndif_	(B)
Dwelling	town	Suburbs	ferent	Yes	town	Suburbs	ferent	Yes	town	Suburbs	ferent	Yes
Home	53.1	30.3	16.6	20.7	42.6	19.5	37.9	13.2	55.9	32.5	11.6	10.5
Apartment	57.3	28.1	14.6	43.0	46.8	35.1	18.1	54.1	85.8	12.7	1.5	33.3
Rancho	37.0	34.3	28.7	34.1	30.2	13.4	56.4	30.1	39.8	42.9	17.3	22.5
Other	57.6	25.3	17.1	43.3	45.7	20.0	34.3	17.1	52.4	33.3	14.3	17.0
Total	52.7	29.6	17.7	34.6	41.4	20.9	37.7	19.9	51.5	35.2	13.3	16.0

will live in the new housing units. It is only over time that people adjust to new living styles and can be trained to change their consumption patterns. Such was the problem of the <u>superbloques</u> in Caracas when they were first built.

In MERCAVI's survey there were several questions directed to determine the preferences of the heads of family with respect to housing. I selected four of the responses because of their relevance to this chapter. The phrasing of the questions can be seen in Tables V-26, V-27 and V-28.

1) In Table V-26 we see that opinions on the share of income spent on housing vary between cities depending on prevalent housing conditions. Whereas in Caracas, of all the households that spent up to 20 percent of their income on housing, 74 percent consider the current expenditure adequate or low, in Barquisimeto that percentage is only 59 percent. Except for Barquisimeto, two-thirds or more of the household heads seem to accept 11-15 percent as an acceptable share of income to spend on housing.

2) The responses given in reference to the maximum contribution for housing they can afford (see Table V-27) seem contradictory to the results shown above. Household heads, irrespective of income level, invariably feel that their actual contribution is above the maximum contribution they can make. The responses might be biased by the form in which the question was posed or by a fear of unknown repercussions. Perhaps it shows simple ignorance of the housing market conditions.

3) Venezuelans have a distaste for apartment living. Even household heads living presently in apartments are divided in their response. Caracas is the only city in the country with an important proportion of the housing inventory in apartments. Thus, it is not surprising that Caraqueños accept apartments more than other Venezuelans (see Table V-28).

4) Lastly, we see that living downtown is preferred to the suburbs. Part of the reason could be that large cities tend to be surrounded by a belt of barrios and people do not want to associate with them. Notice that rancho dwellers are the least enthused about living downtown. More important, Venezuelans in general like to be in the center of activity (see Table V-28).

Summary

In this chapter I found that only two variables are highly significant in determining the expenditures of households on housing: income and education. The low values of (R^2) obtained in the multiple regression where the main variables of the model were applied simultaneously, indicate that either:

- a) other important explanatory variables have been omitted;
- b) the functional relationships used do not fit the true relationships; or

c) measurement errors of the data are very large. I am inclined to accept the last two reasons.

The influence of income on (X) varies widely, depending on the method used to measure permanent (Y). Of the three methods applied the best regression fits and the highest values of (^bXY) were obtained with the average value data from nineteen cities. In this sample the elasticity of income is highest for the households living in the middle income sector and falls drastically for the high income sector (Zone 5). However, taking the average of the limits of the direct and inverse regression coefficients, in order to correct for heteroskedasticity, shows that (^bXY) is close to one for all zones. Renters tend to spend a larger share of income on housing than mortgaged owners. Part of this difference stems from the cost in maintenance, repairs and taxes which are included in rents but not mortgage payments, and part in the failure to adjust monthly payments for the downpayment. The elasticity of income is very similar for the total sample, for both types of tenure, but it differs when grouped by zones.

Age is more important than either sex, household size or household type as an explanatory variable, but not sufficient to accept it as statistically meaningful in most cases. The fact that (S) and (H) have a coefficient almost uniformly with a negative sign does show, however, that female heads and households with additional families tend to spend less on housing and have lower (^{b}XY). The number of contributors to the household income (EY) appears to be inversely related

to the share of income spent on housing. Although low, the elasticity of (Y) with respect to number of rooms (R) is significant. Since $({}^{b}RY)$ is much lower than $({}^{b}XY)$, I infer that increases in housing consumption are directed toward either larger rooms or larger, more costly, land areas.

Urban Venezuelans strongly prefer to live in separate homes in downtown areas instead of apartments. The majority view 15 percent of the income as being an adequate share to spend on housing.

As I stressed at the beginning of the Chapter, Zone 1 was treated as a separate housing market for the greater part of the analysis. The results obtained in the multiple regression analysis for this Zone, although interesting, are too unreliable for policy-making purposes. The measurement of housing consumption is too ambiguous. These measurement errors are partially reflected in the substantially lower values of (R^2) for Zone 1 than Zones 4 and 5. Furthermore, the values of the coefficients that correspond to Zone 3 are also most likely biased due to institutional constraints.

Housing conditions are more deficient in Ciudad Guayana in every zone than in any other city analyzed, although the proportion of ranchos is smaller. To a large extent the problem stems from the inadequacy of public services. The number of new migrants to Ciudad Guayana has outnumbered the creation of employment and the construction of low-cost housing. Without steady jobs, no housing program can hope to solve the

housing problem. Households will not make a commitment on a fixed monthly expenditure without assurance of a steady, even if low, income flow. One additional problem appears to be that many migrants view their stay in Ciudad Guayana as only temporary. It is used as a spring-board to the central regions.

In the next chapter, the conclusion, I will relate the results obtained in this chapter and the previous chapter and assess their meaning.

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CHAPTER VI

SUMMARY AND CONCLUSIONS

Introduction

The housing deficit problem has reached staggering proportions in Latin America. Housing conditions in Venezuela are not as critical as in some of its neighboring countries. Still, approximately 23 percent of all households.in urban areas above 10,000 inhabitants are either badly housed or lack housing altogether.^a The high concentration of the deficit among households with incomes below Bs.1000 (81.5 percent of the total) points to the strong correlation between low incomes and deficient housing.

Other than income, the other two major factors that have been responsible for poor living conditions of large segments of the population have been a) the absence of an active housing mortgage market and b) the price of land.

Until recently private construction of housing was directed basically to high and upper-middle income groups. These were the only income groups that had access to the mortgage market. This market consisted mainly of lending operations on a short term basis, by non-institutional investors

^aThe definition of bad or inadequate housing is given in Chapter V and Appendix D. This definition is based on lower but more realistic standards than those applied by most international agencies and national governments.

(personal contacts) or commercial banks. Only a small share of the mortgage loans were used for the actual purchase or construction of homes. Instead, they were used mostly for commercial transactions and working capital.

The overthrow of the dictator, Perez Jimenez, in the late 1950s was followed by a recession. Government policy and the general economic outlook changed and affected the housing market in the years to follow. The policy was twofold: economic and social. The economic approach consisted in revitalizing the construction industry that was in a deep slump and using it as a leading sector in the creation of employment. This was accomplished by passing legislation and providing seed capital for the mortgage banks, savings and loan associations, and the Foundation for Community Development.

The social policy was created by the realization that housing conditions among the urban low-middle and low income groups had reached critical and potentially explosive levels. The urban public housing agency, Banco Obrero, has substantially increased its construction operations during the past ten years. More important, it developed new, yet more innovative programs in an attempt to find realistic solutions to the housing problems of the urban poor. The final step has been the creation of a Ministry of Housing.

Any major effort, private or public, to improve housing conditions, however, will be frustrated unless legislation

curtails land speculation. In most of Caracas land prices are already too high for the construction of single family dwellings of households earning less than Bs.2000 in 1972.

The Model

As a result of the increased housing construction activity and the expected growth of this industry, the need for a comprehensive housing market model in Venezuela has become apparent. Thus far there has been no attempt made to build such a model. This study is expected to have made a partial contribution toward this end by analyzing the demand for housing in urban areas.

Housing demand is dependent on a large number of socioeconomic and demographic variables. The housing market model builder has to decide, at the outset, which are the most relevant variables to be included in the model. In addition to a selection of the most important variables, it is also important to have an indication of their relative weights and their functional relationship with demand for housing. One parameter which is of particular interest to the economic analyst is the elasticity. Despite the limitations of shortrun elasticities obtained from cross-section analysis, they are still a useful tool in dynamic analysis.

This study has attempted to determine what these variables are, to estimate their parameters, and to measure how much of the variation of housing expenditure around its mean is explained by the individual variables and their combined

effect. These were accomplished by simple and multiple regression analyses. The functional forms between the dependent and independent variables were derived by studying crosstabulation results and looking at previous studies. The variables were chosen on the basis of economic theory and studies undertaken by other authors. The study also has incidental results which are discussed as they appear in each chapter.

The data used are all cross-sectional and relate to urban areas. They were drawn from four sources. Three of the sources are based on household surveys, one of which was nationwide. The fourth consists of information on almost all the accepted mortgage applicants during 1970 of the 13 city-member savings and loan associations.

From the outset, it was apparent that the sample had to be disaggregated into relatively homogeneous groups. Aggregate results are good indicators of trends, but they are not very useful to the policy-maker, who is interested in housing needs of specific groups and areas. The basic sample stratification was done according to tenure, income, housing type, and cities.

Since demand was measured in terms of monthly cash outlays, non-mortgaged owners were excluded from the analysis because of the difficulties associated in imputing reliable rents. Among the mortgaged owners, the sample was further divided into new mortgagors and all mortgagors.^b I assumed

^bNew mortgagors refers to all households who initiated

expenditure on new mortgagors to reflect more closely equilibrium levels of housing consumption. Renters were analyzed separately.

With respect to income level and housing type, in the study of new mortgagors, the sample was divided into five income levels and two dwelling types: Apartments and homes. In the study of renters and all mortgagors, both income and dwelling type are incorporated into the same variable: urban sector (zone). Each city was divided into five sectors according to neighborhood characteristics, which serve as a proxy for income and dwelling type.

By city, the sample was stratified into large cities, five in Chapter IV and four in Chapter V, that differ in their socio-economic and administrative characteristics.

The Results

The analysis tested three hypotheses.

Hypothesis I

"Housing is a normal good, i.e., the elasticity of income with respect to housing expenditure is close to one $({}^{b}XY \approx 1)$ ".

This hypothesis can neither be accepted or rejected. The elasticity depends on the method used to measure income and the income range considered.

^b(Continued) a mortgage during the study period-1970 (B.N.A.P. sample). In the sample of all mortgagors no time distinction is made (MERCAVI).

In a study of housing demand, I consider that permanent income is a better determinant of households' decisions with respect to housing consumption than current income. The difference between permanent and current income is a transitory income component which can be positive or negative. Several methods were applied to separate the transitory component of income.

The elasticity (^bXY) for the total sample is highest for the method which I consider to approximate permanent income more closely (average values between cities). In this case, (^bXY>1). When, instead of average values, I applied individual consumer unit data in the regression analysis, (^bXY<1) for the total sample, for every city and for every type of tenure or dwelling type. The values ranged between .32, for the sample of public housing renters in Barquisimeto, and .87, for the sample of mortgaged owners in residential areas in the same city.

The elasticity of income changes widely between income ranges. In the case of new mortgagors, when monthly payments were adjusted upward for the downpayment, the elasticity of income rises to 2.06 for the middle income group and falls drastically to .39 for the highest income group. The same tendency is noticed in the study of renters and all mortgagors. The tables of average values indicate a trend for the share of income spent on housing to fall with increases in income. The best fit of the regression was usually obtained for the quadratic form, which also points to a parabolic relationship between (X) and (Y).

When adjusted for downpayment, mortgaged apartment owners tend to spend a smaller share of their income on housing and have a lower (^bXY) than home owners. Comparisons between renters and mortgaged owners are difficult because of the differences in measuring housing expenditure. The results should be considered separately. Caraqueños and Valencianos spend a larger share of their income on housing and have higher (^bXY) than dwellers in other cities. Hypotheses II and III

As hypothesized, income is the most important explanatory variable. In the multiple regression with six explanatory variables, more than 50 percent of the variation of housing consumption around its mean was explained by income.

Age is not as important as was assumed, but still significant in some regressions under the 20 percent level of significance. It is most significant when it is partitioned into age groups and used as a dummy variable.

The size of the coefficients of the dummy variables and the fact that the fit of the regression is best for the non-linear function, indicate that housing demand increases with age up to a peak and then either levels off or falls. The value of (\mathbb{R}^2) in the simple regression of (A) with (X) is low (10 percent).

Sex is not statistically significant. The sign of the coefficient for the dummy variable for female household heads is almost invariably negative. Thus, there is a

tendency for female household heads to spend less on housing and to have lower income elasticities.

Downpayment is a very significant variable. Unfortunately, the data used to test for downpayments stems from the savings and loan associations which have institutional limits on downpayments and interest rates. Thus, the results are probably institutionally determined. They indicate housing expenditure increasing with increases in the downpayment. Bather than measuring the effect of downpayment on housing demand in a multiple regression analysis, it would be more fruitful for policy making purposes to study the number of households that have gained access to mortgage loans by changes in downpayment requirements.

The maturity period is also significant in almost every case at levels of significance of the coefficient of 15 percent and under. The sign of the coefficient for (P) is negative. This indicates that mortgagors do consider total interest cost, and as house values rise, they prefer to pay larger monthly payments for shorter periods.

Housing demand varies markedly in many of the tests between cities and urban sectors. Within cities the major differences are between Caracas and Valencia and the other cities. In urban sectors it is between slum squatters, public housing, and high residential areas.

Education proved to be the most significant explanatory variable, after income, in almost every regression. The sign

of the coefficient, as expected, is positive but the elasticity $({}^{b}XE)$ is relatively low (.30). Education, social status, security, and the willingness to make major contractual commitments seem to be closely related.

Household size was quite uniform at all income levels and urban sectors but differed between apartment and homes. It is not significant as an explanatory variable.

Conclusion

Any comprehensive housing market analysis of Venezuela should include the following four variables in the demand model: income, education, age and tenure. The sample should be further divided by income groups and should avoid making nationwide assumptions. Households' demand for housing is most responsive to income change at the lower income levels.

Demand for housing, in terms of current expenditure, is less responsive to the combined effect of all socio-economic variables selected than was anticipated. An important share of the variation is left unexplained. The problem may lie more in measurement errors than in having omitted important explanatory variables. The measurement error is particularly important in the data that refers to slum squatters. Furthermore, the results obtained for public housing probably suffer from bias because of the institutional limits associated with controlled housing. Hence, the results which are most reliable are probably those obtained from data of the savings and loan associations and the middle and high income residential areas.

Employment creation per bolivar spent is highest in the construction of housing built for low and middle income groups, and not for luxury homes, as is frequently assumed.

The housing deficit in Venezuela will probably be reduced if the present efforts by private and public institutions continue. The housing problem, however, is not likely to be solved completely.

Forty-five years of almost continuous and high rates of growth in Venezuela have failed to incorporate a large segment of the population into the economic stream of the nation. If high rates of unemployment and population growth, and barriers towards equalization of income are inherent in the Venezuelan economic system, the housing problem will not be solved. APPENDICES

APPENDIX A
APPENDIX A

ON SQUATTER SETTLEMENTS

Of all areas in housing, none has attracted more research among social scientists in Latin America than the formation of squatter settlements. This interest is justified given the rate of growth at which squatters have sprawled since World War II. While the main Latin American cities have grown, on the average, between 5 and 7 percent annually, the barrios grew by 10 to 15 percent. [6]

Venezuela is no exception. The current relative importance of these urban sectors (Zone 1) in Venezuelan cities is reflected in the percentage of the housing stock formed by ranchos. MERCAVI's 5 percent sample of the housing inventory gives the following shares: Caracas 39.2 percent, Valencia 41.0 percent, and Ciudad Guayana 22.8 percent.

An explanation for the "reason of being" of the barrios entails an understanding of the structure of Venezuela's economy. Urbanization has dramatically outpaced industrialization. According to Frankenhoff, "The slums play a positive role in the urbanization process, being a necessary phenomena in a developing economy. It is an area of transitional shelter for poor migrants." [7] Turner states it differently:

> "The squatter settlements are an expression of 'normal' urbanization processes under 'abnormal' historical conditions...They are the perfectly

natural reaction to the difference between popular housing demanded and that supplied by the institutionalized society." [8]

In the barrios, as in most conventional urban areas, the private and community facilities are in varying stages of development. The U.N. has classified them into three broad categories: 1) internal slums, 2) internal areas in deterioration, 3) external or periferic slums. Of the three groups usually the largest and most progressive is the "periferic slums".

"Unlike the typical slum quarters of industrialized nations in which old buildings with once satisfactory conditions have deteriorated over the years, the conditions in most barrios improve with age." [9]

They are slums of "hope" rather than "despair" stimulated by their freedom for improvement and expansion. Surveys taken of the barrios invariably indicate a spirit of "optimism" among the dwellers. In a survey of barrios in several cities, when asked, "What will your situation be in the next five years?" 70 percent of the respondents felt it would improve and only 7 percent replied that it would worsen. More important, when asked where they would prefer to live, 82 percent indicated their preference for the same urban sector. Only 8 percent felt that housing was the most important problem in improving the area where they lived. Public services was mentioned as the number one problem. [10]

Besides age, the "legal" status of land is the major determinant of the stage of development of a barrio. The

amount of investment the squatter settler puts in his home depends on the certainty of any future action of the authorities in regard to the land they have built on. Most barrios in Venezuela have been created by the illegal possession of public or private land. A small number of them have been officially settled by government authority without charge for the land. In Puerto la Cruz a survey indicated that only 30 percent of the squatter settlers had paid for the land. [11]

Public action so far has not been very successful. In the early 1950s, the Venezuelan government tried to eradicate the ranchos in Caracas by building fifteen-story highrises. The problems that developed due to administrative and planning flaws, but in particular the unfamiliarity of rancho dwellers with massive vertical living, are well described in a special report written in 1959. [12] Although the Banco Obrero has learned from its early experiences, it is becoming increasingly aware that it can provide housing for only a small percentage of the squatter settlers.

Recently, governments throughout Latin America have been changing their approach in regard to their low-cost housing programs. [13] Instead of undoing that which the squatter settlers have built through great efforts, the new programs call for cooperation. These programs, referred to as "sites and services", consist of providing the slum settlers with parcelled land with a minimum amount of public services. The construction of the housing units themselves are left

to the settlers, with the promise by the government of increasing the services upon a progressive improvement of the "ranchos". At times the public agencies also provide technical assistance and loans for construction materials.

After this short review, the problems involved in a study of demand for housing of Zone 1 should be apparent. It must be viewed as a separate housing market:

- 1) Since land is usually not purchased, rents can only refer to the value of the structure.
- 2) Since mortgage loans are not available for the construction of ranchos, a study of housing demand in terms of monthly payments is not applicable.
- 3) Given that rents are prohibited in some areas, normal market operations are limited.
- 4) Imputed rents are not very meaningful since "ranchos" generally improve in time. Present house values seldom reflect equilibrium levels of housing consumption.

APPENDIX B

APPENDIX B

IMPUTED WEIGHTS (IN POINTS) OF CONSTRUCTION MATERIALS USED AND AVAILABLE PUBLIC SERVICES FOR BACH HOUSING UNIT

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A. Public Services

в.

1.	Water		
	Aqueduct in the house or lot acceptable Public faucet at less than	20	points
	100 m semiacceptable Public faucet at more than	12.5	points
	100 m unacceptable	0	**
	Water-truck unacceptable	0	**
	Well, or similar unacceptable	0	H
	River or creek unacceptable	0	н
2.	Toilet Facilities W. C. connected to sewage		
	system acceptable W. C. connected to septic	16.5	points
	tank acceptable	16.5	M
	Well W. C. or outhouse semiacceptable	5	м
	Outdoors or none at all unacceptable	Ō	••
3.	Lighting		
-	Electric acceptable	9	points
	Other unacceptable	0	H
4.	Road Access		
	Street fully or partially		
	paved acceptable	4	points
	Unpaved street semiacceptable	3	"
	No street unacceptable	0	
5.	Garbage Pick-up		
	Public pick-up acceptable	0.5	points
	Other unacceptable	0	M
Cor	nstruction Materials		
1.	Ceilings		

Tiles, zinc, metal and similar acceptable 15 points

Cane, palm branch, straw and similar unacceptable 0 points 2. Walls Blocks or bricks, adobe, wellcut wood. acceptable 25 points Straw, thatch, cane, palm branch, etc. unacceptable 0 H 3. Floors 10 points . Unpaved unacceptable 0

Source: B.N.A.P., "Presentacion de la Primera Serie de Resultadoes Parcial s del Estudio del Mercado Real de Vivienda en Venezuela" (forthcoming publication), Caracas, Venezuela (April 1971), pp. 22-24.

APPENDIX C

ADDITIONAL REGRESSION RESULTS

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Table of Regression Results with (X) as Dependent Variable and (Y), (E), (S), (N), (A) and (H) as Independent Variables for Caracas by Zone and Tenure

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	Sample Size	- -	R ²	۹ م	_ م	م م	P ^N q	р Р	р ^н
Total Sample Mortg.Owners	364	-172.3	.42	.07 (.007) R ² .29	60.3 (9.5)	-36.1 (42.0) 397	-15.8 (6.6)	5.3 (1.4)	-50.3 (62.7) 432
Total Sample Renters	312	-119.5	67.	.09 (.007) R ² .27	36.6 (8.2)	11.4 (36.5) 75 7	89 (5.8) 85 2	3.2 (1.3)	-111.8 (66.9) 92
Zone l Total Sample	250	3.12	.21	.06 (.01) R ² .10	11.9 (5.5)	-29.4 (21.6) 17%	792	2.36 (.64)	-37.4 (25.7) 14 2
Zone 3 Mortgaged Owners	221	-9.4	.15	.02 (.006) R ² .10	21.3 (5.2)	28%	322	1.60 (.83)	242
Zone 3 Renters	207	69.5	.32	.05 (.008) R _d ² .18	15.7 (6.1)	-37.6 (17.4)	-4.2 (2.6) 112	-1.8 (.82)	-70.7 (21.4)
Zones 4-5 Mortgaged Owners	213	274.5	.42	.10 (.09) R ² .09	18.8 (12.1)	652	372	612	672
Zones 4-5 Renters	245	106.7	.52	.11 (.009) R ² .25	25.4 (11.2)	-81.9 (54.3) 13Z	14.4 (11.1) 192	, 2.4 , (1.8) 17 2	276
				1	•			•	

H = 1 households with additional family H = 0 otherwise

> Key: S = 1 if head of household is female S = 0 otherwise

Table of Regression Results with (X) as Dependent Variable and (Y), (E), (S), (N), (A) and (H) as Independent Variables for Valencia by Zone and Tenure

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	family	additional	holds with wise	H = 1 house H = 0 other	female	hold is	d of house ise	= 1 if hea = 0 otherw	Key: S S
95%	' 27 X	44.3 (9.3)	332	26.5 (9.6)	.04 (.01) R ² .33	.42	95.8	116	Zones 4-5 Renters
40X	95 Z	412	742	56.7 (24.9)	.02 (.02) 41%	.21	241.4	40	Zones 4-5 Mortgaged Owners
-588.6 (184.4)	33 X	85.12 (20.99)	582	7 04	.10 (.02) R ² .09	.84	-318.3	11	Zone 3 Renters
912	.86 (.37)	3.14 (1.80)	-29.6 (11.5)	284	.004 (.003) 262	.15	149.1	133	Zone 3 Mortgaged Owners
-95.0 (35.6)	772	572	95%	482	.07 (.01) R ² .008	.23	69.9	122	Zone 1 Total Sznple
-46.0 (53.9) 392	2.02 (1.01)	6.7 (4.4) 132	21.7 (37.2) 562	38.7 (7.1)	.08 (.01) R ² .36	.51	-152.3	240	Total Sample Renters
115.9 (152.8) 402	5.6 (2.1) 452	-7.6 (8.7) 39%	-29.7 (57.6) 612	37.9 (12.4)	.08 (.01) R ² .31	.48	-215.2	108	Total Sanple Mortg.Owners
р ^Н	β	P _N	ь _S	P ^E	р _Ү	R ²	đ	Sample Size	

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Table of Regression Results with (X) as Dependent Variable and (Y), (E), (S), (N), (A) and (H) as Independent Variables for Barquisimeto by Zone and Tenure

X = P(Y, E, S, N, A, H)

	Sample Size	ся Т	R ²	ρ ^γ	۔ م	s _q	P P	P ^q	р ^н
Total Sample Mortg.Owners	292	31.7	.77	.06 (.002) R _d .10	5.61 (3.65) 12%	13.12 (14.6) 372	-3.07 (2.40) 19%	.27 (.58) 65%	-76.6 (57.8) 18%
Total Sample Renters	215	-120.6	.47	.05 (.006) R _d .32	22.8 (4.91)	-34.1 (17.1)	-2.8 (2.5) 257	2.53 (.62)	13.0 (57.4) 822
Zone l Total Sample	319	30.2	.25	.047 (.005) R ² .05	1.77 (.07) 15%	65%	58%	78%	32%
Zone 3 Mortgaged Owners	220	106.5	.13	.020 (.005) R ² .07	4.84 (2.95) 92	36%	-3.05 (2.2) 17%	472	-95.8 (50.8) 62
Zone 3 Renters	53	116.9	.29	.05 (.01) R _d ² .28	542	202	51%	41%	32%
Zones 4-5 Nortgaged Owners	16	65	·96	.05 (.004) R ² .44	60.4 (24.0)	222	52%	232	282
Zones 4-5 Renters	47	38.0	.54	.04 (.01) R _d ² .36	26.8 (14.5) 72	78%	272	762	652
Key: S S	<pre>= 1 if hea = 0 otherw</pre>	ad of hous. vise	ehold is f	female	H = 1 hous H = 0 othe	eholds with Twise	additional	family	

Table of Regression Results with (X) as Dependent Variable and (Y), (E), (S), (N), (A) and (H) as Independent Variables for Ciudad Guayana by Zone and Tenure

			X	= P(Y, E, S	;, N, A, H)				
	Sample Size	g	1 R ²	р _Ү	Р _Е	PS ^q	Р ^И q	р ^А	P _H q
Total Sample Mortg.Owners	459	-47.9	.34	0.40 (.004) R ² .22	23.1 (4.1)	-13.9 (19.3) 482	-5.33 (2.15)	2.34 (.61)	-31.2 (28.9) 28%
Total Sample Renters	288	28.9	.36	.40 (.005) R ² .17	4.4 (.10) 10%	1.1 (25.2) 92%	3.6 (2.8) 19%	.13 (.69) 83%	-12.8 (47.5) 78%
Zone l Total Sample	107	-39.4	.46	.09 (.01) R ² .16	13.7 (5.1)	-31.4 (18.9) 10%	39%	27%	53%

Key: S = 1 if head of household is female
S = 0 otherwise

H = 1 households with additional family H = 0 otherwise

Table of Regression Results with (X) as Dependent Variable and (Y), (E), (S) and (H) as Independent Variables for Caracas by Zone and Tenure

logX = F(logY, logE, SlogY, HlogY, S, H)

	Sample Size		R ²	b _{logY}	b _{logE}	b _{Slog} y	b _{Hlog} Y	b _S	р _Н
Total Sample Mortg.Cwners	364	34	.46	.64 (.05) R ² .24	.31 (.09)	16 (.13) 22%	.45 (.20)	52 (.42) 22%	-1.8 (.71)
Total Sarple Renters	312	.06	97.	.65 (.06) R ² .22	.33 (.11)	Cl (.11) 882	31 (.26) 23%	.08 (.35) 80%	.87 (.83) 30%
Zone l Total Simple	250	.52	.23	.49 (.37) R ² .67	.27 (.09)	63%	025 (.C19) 19%	68%	57%
Zone 3 Mortgaged Omers	221	1.20	.18	.28 (.05) R _d .09	.27 (.07)	29%	96%	24%	08 (.05) 112
Zone 3 Renters	207		• 28	.53 (.08) R ² .11	.40 (.11)	82*	39 (.22) 7 X	09 (.04)	-1.09 (.71) 12%
Zones 4-5 Mortgaged Owners	213	1.59	.24	.32 (.05) R ² .09	.09)	266	202	985	242
Zones 4-5 Renters	245	.58	.57	.64 (.04)	402	63%	982	83%	952
Key: S = S =	1 if head 0 otherwi	of houser se	nold is f	enale	H = 1 house H = 0 other	holds with wise	additional	£am1ly	

Table of Regression Results with (X) as Dependent Variable and (Y), (E), (S) and (H) as Independent Variables for Valencia by Zone and Tenure

logX = F(logY, log2, SlogY, HlogY, S, H)

	Sample Size	¢	R ²	blogY	blogE	bslogy	bHlogY	b _S	р _Н
Total Sarpie Mortg. Owners	108	68	.50	.70 (.09) R ² .24	.24 (.14) 8%	19 (.21) 37%	.24 (.58) 67%	.56 (.65) 395	71 (2.05) 93%
Total Sample Renters	240	.20	67.	.63 (.06) R ² .27	.38 (.10)	.01 (.20) . 94%	07 (.:48) 88%	04 (.53) 947	. (1.63) 90%
Zone l Total Sample	122	.33	.25	.59 (.09) R2.008	33%	277	09 (.03)	86%	68%
Zone 3 Mortgaged Cuners	133	1.85	.03	.12 (.c4) R ² .03	209	02 (.009) 1C%	70%	52:	67%
Zone 3 Renters	11	143	.64	.65 (.1è) R _d .cc7	\$78	512	269	33 (.15)	269
Zones 4-5 Mortgaged Cuners	40	1.58	.30	.21 (.14) 163	.é0 (.23)	89%	%06	216	5 5 5 5 5 7 5 7 5 7 7 7 7 7 7 7 7 7 7 7
Zones 4-5 Runters	116	1.26	.32	.33 (.07) R _d .17	.2 ⁹ (.11)	\$0%	80%	10 (.07) 17%	80%
Key: S = S	1 1f head 0 othersi	of houser se	old is 1	i enale	H = 1 house H = 0 other	hol ds with wise	additional	family.	

•

Table of Regression Results with (X) as Dependent Variable and (Y), (E), (S) and (H) as Independent Variables for Barquisimeto by Zone and Tenure

.

logX = F(logY, logE, SlogY, HlogY, S, H)

	Sample Size	g	R ²	b _{logY}	b _{logE}	bsicgY	b _{Hlog} y	- م م	н н _д
Total Sample Mertg.Owners	292	59	.40	.61 (.06) R ² .19	.29 (.09)	16 (.12) 18%	04 (1.03) 92%	58 (.35) 92	34 (2.97) 87%
Total Sample Renters	215	.35	. 50	.56 (.c5) R ² .31	60°)	.12 (.13) 37%	14 (.56) 817	19 (.36) 61%	.40 (1.81) 83%
Zone 1 Total Sumple	319	.67	.21	.38 (.05) R _d .05	.13 (.06)	c2 (.01)	60%	76%	52%
Zome 3 Mortgaged Camers	220	•95	.21	.33 (.06) R ² .11	.21 (.C9)	265	92%	50%	50 (.17)
Zone 3 Renters•	53	1.24	. 25	.32 (.08) R ² .10	58%	267	52%	51%	61%
Zones 4 -5 Mortgaged Owners	16	50	06•	.88 (.08) R ² .02	68%	10 (.C4)	67%	92%	49%
Zones 4-5 Renters	1. -7		.60	. ⁴⁹ (.09) R ² .38	.66 (.23)	33%	71%	35%	68%
Key: S =	1 1f head	of house!	rold is f	emale	H = 1 hcuseh	olds with	additional	family	

ATTINPT U I I M H = 1 nouserolds H = 0 otherwise

> 2001 S = 1 11 nead of S = 0 otherwise

	Sample Size	ta	R ²	b _{logY}	b _{logE}	b _{SlogY}	b _{Hlog} Y	PS P	р _Н
Total Sample Mortg.Owners	459	.59	.33	.32 (.03) R ² .20	.44 (.07)	08 (.09) 37%	08 (.18) 67%	.26 (.27) 36%	14 (.58) 79%
Total Sample Renters	288	•46	.33	.50 (.06) R ² .17	.21 (.10)	.03 (.15) 81%	.13 (.28) 65%	06 (34) 86%	37 (.92) 69%
Zone 1 Total Sample	107	.64	.34	.45 (.07) R ² .13	.22 (.10)	24%	-1.38 (.75) 7%	23%	3.30 (1.90) 9%
Key: S =	1 if head c	of househ	old is f	emale	H = 1 house	nolds with	additional	famíly	

-

Table of Regression Results with (X) as Dependent Variable and (Y), (E), (S) and (H) as Independent Variables for Ciudad Guayana by Zone and Tenure

logX = F(logY, logE, SlogY, HlogY, S, H)

167

S = 1 if head of household is female S = 0 otherwise

H = I households with additional family
H = 0 otherwise

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and (N) as Independent Variables by Tenure and Type of Dwelling with U.C. Data Table of Regression Results with (X) as Dependent Variable and (Y), (A)

				Valencia	-				
				logX=	F(logY,	logA, Nl lc	gY, N2 log	Y, NI,	N2)
Sample	Sample Size	Ø	R^2	$^{\rm b}_{\rm logY}$	b _{logA}	b _{N1} logY	b _{N2} logY	1Nq	b _{N2}
Tmniited Rent	187	81	.46	.68 (.08)	.56 (.17)	.07 (.13)	.19 (.22)	29 (.42)	70 (.67)
				R ² .25		61%	39%	267	30%
Monthly	57	70	• 56	.92 (.14)	.08 (.28)	05 (.27)	-1.40 (.57)	.09 (.86)	4.13 (1.83)
Payments				$R_d^2.22$	77%	86%		92%	
Total Sample	170	- 89	.53	. 83	.39	15	24	.29	.48
(Imputed, Real or				(.08)	(10)	(13)	(77)	(14.)	(.69.)
Monthly Payments)				R _d .25		25%	28%	48%	48%
Rancho	67	.47	.13	.29 (.15)	.19 (.27)	06 (.24)	.17 (.37)	.16 (.66)	43 (1.06)
				6%	50%	80%	65%	81%	269
Conventional	163	31	.51	.69 (.07)	.31 (.14)	01 (.14)	12 (.17)	05 (.44)	.19 (.52)
Housing				R ² .18		81%	%67	206	71%

NO = 0-5 members N1 = 6-8 members N2 = 9 + members Key:

-19
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В
IAB

Table of Regression Results with (X) as Dependent Variable and (N) as Independent Variable by Type of Dwelling and in Three Functional Forms with C.V.G. Data

			Cludad Gu	ayana				
	•		logX=F(logN)		X=F (N	, ^{N²)}	-	X=F(logN)
Sample	Sample Size	R ²	^b logN	R ²	р ^у	b _N 2	R ²	b _{logN}
Rancho	92	000.	.004 (.10)	.007	-4.6 (6.9)	.38 (.51)	100.	2.6 (19.2)
			97%		72	z		89 %
Conventional Housing	225	000	.01 (.07)	.007	21 (11.2)	25 (.83)	.005	-33.1 (32.8)
			206		77	~		31%

•

TABLE V-19a

Table of Regression Results with (X) as Dependent Variable and (A) as Independent Variable in Three Functional Forms with Constant (N) and (Y) with C.V.G. Data

Cludad Guayana

			logX=F(logA)		X=F (A	•,A ²)		X=F(logA)
Sample	Sample Size	ً ^R	b _{logA}	R ²	р <mark>у</mark>	b _A 2	R ²	b _{logA}
Conventional Housing Constant:	45	£00°	.14 (.50)	.04	-28.9 (27.8)	.40) (.37)	.002	54.5 (235.6)
Members 4-5 Income: Bs.1300- 2300			7 9 %		23	1		82%

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T A

Table of Averages (with Constant Income Bs.1500-2000) of Share of Income Spent on Housing According to Number of Income Contributors by Tenure for Caracas and Cd. Guayana

		Ratio of A/B	.10	06.	.11	.60	.14	06.	.60	.60
•		Income Head	1746	1124	687	480	1768	1192	1060	1000
	Guayana	(B) Income Family	1746	1716	1757	1700	1768	1713	1841	2000
	Cd.	(A) Rent or Payment	183	171	196	115	252	167	123	126
		% of Households	62.0	26.1	9.1	2.8	69.3	21.6	6.3	2.8
		Ratio of A/B	.22	.16	.16	.10	.22	.20	.14	.12
		Income Head	1741	1048	796	411	1710	1057	768	461
	Iracas	(B) Income Household	1741	1658	1741	1714	1710	1697	1844	1702
)	C	(A) Rent or Payment	383	274	281	181	389	341	274	210
)		% of Households	41.4	31.0	16.1	11.5	48.5	29.6	14.0	7.9
		Number of Income Contributors	 	23860 878 0	mw0 Mune Morte	4	1	7 1613	ო კიეგ	4

APPENDIX D

QUESTIONNAIRE FORMS USED IN SURVEYS



MERCAVI, con't page 2

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	s Construction (only owners)	Hide frames de sousteristod	TUTS DOUSE IS SETT-COURT ACCERT	37 · [] Yes 2 [] No		rty 'Indicate Find v. from the former of the second s	ncil • Ir. of const.	[14] 04 [20] [20] [20] [20] [20] [20] [20] [20]	"" rice of the first of motified of the first of the firs	land land cations	ym. s.Occupants	aid # of permanent Upservations	t inhabitants of	unit			of informant						0,2,2, 3,4,1,14
.ly		Land		paid	-paying	ing to private par	ing to munic. cour	led			s Monthly pa	Indicate amt. p	monthly for uni			49. 30 31 31	s. Family code	Princinal	family	(+++mp)+	Additional	families	
ising - Fami	. Tenure		. 36	· [] Self-	• 🗆 Self-	• [] Renti	• [.] Renti	• 🛛 Invad	• 🗆 Other		(ylno s:	quisition,	covements .	by:	issociation		stitutions		or insur.Co	~			
s Relationship of Hou	n	Housing.units	39	· 🗖 Self-paid	Self-paying	, 🖸 Rented	• Other	• 🛛 Unsure	situation		<pre>>c Financing (owner</pre>	The credit for the ac	construction, or impu	40 as financed	· 🗂 Savings & loan &	I Worker's bank	• Other public in:	• 🗆 Mortgage bank	• Commercial bank	• [] Local foundation	, 🗆 Private	• [] Without credit	

MERCAVI, con't page 3

PART π i Composition of the Family and Earnings

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MERCAVI, con't. page 4 CODES

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(Use these codes in parts II and IV of this questionnaire correspondingly)

. Head of principal family	arital Status	Profession	or office '(Occupatio	n status	Mode of transport
	. Sinele	Manasers a/o	nrofessiona]s	· Employ	, ed	- Na feot
• Head of addit. family 1 >	2 Married	a Teaching		2 Unempl	oved	* Own car or cab
• Spouse	. Kept	•Militarv		• Studen	. T	
• Single children	 Widowed 	•Laborer		 Homema 	lker	<pre>Public cab</pre>
 Married children 	 Divorced 	•Merchants for	self-employed)	s Incapa	Icitated	• Bus
 Spouse's married children 	 Separated 			 Servan 	it or	Bicycle cr
<pre> • Grandchildren </pre>		•Clerk or emp	loyee	other		motorcycle
 Other relatives a/o 		7Housewif£e				•Other
persons		•Student			•	
		•Other				
Reasons for m	moving .		Type & Tenants (of Unit	Grade	of Education
Selection of Site	Depar	ture				
· Circumstances of prev.site	Arrival of re	latives/friend	s.Owned home		, Illit	erate
* Accessability to schools	<pre>Inaccessabili</pre>	ty to schools	<pre>rRented Home</pre>		• Only 1	reads & writes
• Facility in obtaining unit	sLower earning	 	*Owned apt.		<pre>Ist-3i</pre>	rd grades
• Have friends or family there	eInsufficient	facilities	 Rented apt. 		 4th-6i 	th grades
• Other family reasons	•Unemployed		• Owned "rancho'		 Complete 	eted hign school
• Concrete offer of	•Natural cause	s (catastro.)	Rented "ranch		• Inconi	plete high school
, Better financial assistande	Difficulty in	obtain. unit	 Sharing units 		<pre>r Comple</pre>	ete voca. school
• Hope of obtaining job	No opening in	your profes.	 Other form 		• Incomi	plete voca. schoo
, Other	or skill		<pre> • Don't know </pre>		• Comple	ete univer. study
• Don't	 Other 				• Incom	plete univer.stud
	° Don't know					

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MERCAVI, con't page 5
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PART II: Opinion of Head of Family

of Line of Informant [...]

```
Bow many yrs. have you lived here
                                                              14 Do you own any homes (other than
       show much do you contribute towards housing pmt
                                                                that which you inhabit)?
        • • • Nothing • • 101-150
                                    • CJ 501-700
                                                                 · DYes
                                                         66
         ■ 1-50
                     • 🖸 151-250
                                    • 🗆 701-1000
                                                                • a 🖸 No
                                                              s Will you sell it to buy other property?
         • D 51-100 • D 251-500
                                    • 🗆 1001-1500
                                                                 I DYes
                                     • 🗆 1501 and more
                                                         67
                                                                 : No
       In relation to your earnings, your payment is:
                                                              • B Do you own any land?
                   Adequate D Low
         • 🗆 High
                                                                 I []Yes
       Indicate your pref. for living in a part. zone
□ Inside city □ Suburbs □ Indif.
                                                         60
                                          • Indif.
                                                                - • 🖸 No
         Inside city
                                                              wWhat use do you plan to give the land?
         • □ North • □ South □ East • □ West• □ Indif.
                                                                Cons.on it Sell it Save w/o cons.
       • Would you like to live in an apt?
                                                         69
                                                              Me Do you have savings?
         ، Yes ،
         I 🗆 No
                                                                  □Yes - Where?
                                               o '
                                                                 I Commercial bank
                                                         70
      • Would you like a new house?
                                                                 : 🗆 Savings & loan association
        · 🖸 Yes
 53
                                                                  Worker's bank
         * 🗆 No
                                                                  • D Mortgage bank
      * Reasons for not wanting a new house
                                                                • mother
 4 85
         · □ Comfortable ambient • □Not enough fin.
                                                                 • 🗆 No
         · DNear work or school · DPurch.present house
                                                               "Do you plan to save in the future?
         ■ Gd.condition of unit □Other
                                                                 I (] Yes
                                                         71

    Low payments

                                                                L I No
            OWNERS ONLY
                                                               mare you saving to buy a home?
         • 
Improvement of home

.c 3s
             Estimated value of imp. (th. of Bs.
                                                                , רן Yes
                                                                I I No
      • Would you desire a new home in the future?
 ×
                                                               e How much could you pay as a downpayment?
         · D Yea
                                                                - Nothing

    Principal family: Go to #14

                                                                                                 10,001-
                                                                201-500 • □ 2001-5000 • □ 20,000
         • 🗆 No
                     Additional family: In the form of
             the principal family, fill in part II:
                                                                               , 5001-10,000 CZ8;8816
                                                                 • [] 501-1000
            "Composition of the Family and Earnings."
                                                              22 Within how much time?
                                                                                                 more
                                                         /4
                                                                 '⊖ Less than 1 year<sup>4</sup> □ 2 years
                                                                 *[] 1 year
                                                                                    • More than 2 yrs.
                                                              as What is the max. monthly pmt. you
      • Within what amount of time?
                                                                 () Nothing
                                                                                    could make?
 60
         () Less than 1 year · 2 years
                                                                                              • L]751-1000
• L]1001-
• L]1500
                                                                 *!) Less than 50 [] 151-250
        • [] 1 year
                               • ; More than 2 years
                                                                 ·CJ 51-100
                                                                                • 🗆 251-500
      " Reasons for desiring a new home:
                                                                 • 101-150
                                                                                7 D 501-750
                                                                                              • 🗆 1501+
        Crowing family
                              • []High payment
        • [] Growing family • []Hign payment
• [] Reducing family • [] Acquis. of own home
                                                              24 What institution are you acquainted with
                                                                that deals with housing problems?
        Distant job/school []Form new family grp.
                                                                 I None-Go to part IV: Migration
                                                        76 77
         • 🗇 Bad cond. of unit. [] Other
                                                                 Public institutions • DLocal found.
        • [] Improvement of life style
                                                                 ון Worker's bank
                                                                                         • Mortg. bank
      " What use would you make of this home?
                                                                 Saving & loan assoc. , Other
ッヘ
                                                              28 llow did you find out of its program?
News-
        ' 🖸 Habitate it
                               • Uluse it occasionally
        * L] Rent it
                               > C; Use it commercially
                                                                              • Cinema • Chaper
• Cinema • Chaper
                                                                 (1) Radio
                                                         /0 73
         C! Sell it
                                                                 IT DI
                                this home.
      * You would like to
                                                              20 Do you know of some office of this inst?
        · ! Own
                        # [] Rent
                                                                            • [] No-Go to part IV
                                                                · C Yes
                                                         80
        OWNERS ONLY
                                                              *7 Sign your name
        What would you do with this unit?
                                                                                     Spec If ically
```

APPENDIX D-2

· .

Na	tional Savings and Loan Bank	
MC	DALITIES	
'Nu	mber of application	
Nu	mber of association	
1d	entification card number	
Pu	rrpose of loan	
Pu Pu	archase of Homes (1) Construction of Homes (2) archase of Apartments (3) Construction of Apartments (4)	
Nu	mber of rooms	
Nu	mber of baths	
Lo	cation of structure	
St	ate (0), Municipality (00), "Barrio" or urbanization (000).	
Pa	rt paid of land	
Pa	rt paid of the construction	
Sa	wings in the association	
Ad	wanced payment	
Se	cond financing	
Ap	pplicant's earnings	
Am	ortization period	
Am	wunt of loan	
Da	te of acceptance	
Mo	onth: (00), Year (0)	

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APPENDIX D-2 con't.



APPENDIX D-3 Joint Research Central Bank of Venezuela University of Carabobo	Survey for the Study of Family Budgets Urban Zones of the Municipality of the District of Valencia,		Name of nead of family Sector Tract Block	Family Number Address	Date	Characteristics of Housing	 4) Type of Housing b) Tenure of Hcusing b) Single fam. b) Apartment 	N"karcho"	Rent or Monthly Payment	Will the Family Yes.	Cooperate: Observations:		Surveyor
				EJOT -			•						
	1												
	-	\neg											
							. 			[
ວແລງ ກະວາເ	L L L L L L L L	юŢ	жрег	-1960) Tea -nrea 8301	Pensions Scholar- Scholar, etc,	TatoT	p]oyed Fm− Self−	մօվյն	-du2 setbts	אנוענט. אפייים משויט:	ទទទពពលរី	Sagew bns Raites	per Mem-
890	Source	ມອເ	(JO WO	ու ու	ບວແໄ			Μοτκ	тотя это	oouľ			
	_			81	odmoM vii	ms4]o noitsiu	omooni ne olso omoo	ουι Κιη Ο μοθεί (1990)	ltnoM Montl	n91qm0J			

Marrie of							
Family Members -	Second Sta-Hon- Second tus all- ty	Present Occupation	Branch of Activity	Occupational Status	Educationa Level	Work	Other Sources
					-		
102			199 × 11				
Choiner al Alla		*					
				2			-
							-
	N LANG CLOS						
							-
							-
							-
						-	-
		ber may	Income fr	om Tenants:	41		11
Servants		In	come from Domestic	Production:	12		-
					-	1	-
the second se	the second second second second second		and the second s				-
Tenants		AT IN A STATE	A - A - A - A - C - A - C - A - C - A	2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/			
and the second se							-
and the second second	and the second second second second					_	-
Nelley			Consol	dation -			1
-	Channel and and	Number of Pers	ons	Income			İ
sestic Production	Total	Members Serva	ats Tenants	Total Work Othe	rr 0 rigin Ten	ants (Imput) Rent	
and the second se	-						1

Family Characteristics

administratively punished under the penal code. The infractions of confidentiality will be 6. Zone 1 0"Rancho"2 C Residential Year Ż TRH UNITY ı 10. Date when questioned A - Location and Control of Surveyed Housing Unit 9. Registered house # 7. Sector or block # 11. Week's rotation # g. Number of home 0 Housing Survey Housing Registration Card (TRH) 12. Month ۰. , Ministry of Development General Administration of Statistics Republic of Venezuela and National Census 2 🗌 Rural Form DGE-EH1 - Have you a tele-Dies-3. Area 1 🖸 Urban 1. Locality 4. District Address **3.** State

APPENDIX D-4

B · Type, Capacity and Tenure o	f Housing Unit
13. Type of Home	Number of Rooms
House	4.Total rooms
- 2 🗌 Apartment in building	S. Total bedrooms
3 Sharing a house or apartment	6. Tenure of house
Sharing a neighboring house	•
s 🗌 Rural home	1 🔲 Owned and totally paid for
* "Rancho"	2 Owned and paying for
Other type (specify)	Rented (Bs. a month)
Commune (specify)	Other form (specify)
C - Economic Activity in the H	
17. In this house, is an article or product sold? Give the name of the product	1 🗌 Yes 2 🗍 No
13. Joes anyone in this house have livestock or have mor 30 foul (chickens, turkeys)?	e than 1 🗌 Yes 2 🗍 Ne
9. Give the quantity. Livestock Poultry 9. Does anyone cultivate on your land, on a plot no les Give the amount of hectares.	s than 1 hectare? 1 🗌 Yes 2 💭 Ne
Observations:	

ane of Persons		Fanily Relation	, visu	tember of						Only for	Perso	ns That	Are Membe	rs of This H	ousehold		
		(Tribad)	H	-asnot	- NOS						hly f	or thos	se older th	an 10 years		_	
tart with the head f the house. List fter, those persons to normally are a		Orderih Fren, maj	tild- or 5 or 5	hold- Circle YES Dr ND	Circle M or F	.9 (G	rchda Ive v	te teh	404	Marital Status- single married	Read	fou fe?	ducation	Profession- Give your true pro- fession,	Nationalit (for those natural-	500	ange in the composition if the Home
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Dairly Questionnaire

Interviewer

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Other services of the house			1-	┢	+	+	╀	╋	╀	╞	ŀ						3.24	
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Kerosene				+-	\uparrow		+	┢	+	┼╼	┝						3.24	.07
Firesord	Corcs		T	-	\uparrow	\uparrow	+	+	+	┝				-			3.24.	.08
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Other heating methods				1-	\uparrow	\uparrow	╀	\uparrow	┢	-				-			3.25	
Clothing and Furnishings				\uparrow	1-		+	+	+-		┼─	┢	-				3.25	.01
Rugs			T	\uparrow	+-	+-	╀	┢	+	+	┢	┢	┝	-	-		3.25	.02
Pillovs	Facn.		Ţ	T	\uparrow	\uparrow	+	+	╋	┢	┢	┢	┝	-	-		3.25.	.03
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Mattresses					1			1	-	1		•	-					
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