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ABSTRACT

THE INCOME REDISTRIBUTIONAL EFFECTS OF TAXES AND PUBLIC EXPENDITURES IN THAILAND: AN INTERTEMPORAL STUDY

By

Medhi Krongkaew

A recent rise in interest in the economics of income distribution has prompted much research on income distribution in both developed and underdeveloped countries. This study, which is one among many, is concerned with the statistical estimation of the income redistributional impact of taxes and public expenditures in Thailand in, and between 1963 and 1969. Knowledge of this so-called "fiscal incidence" is important in evaluating and recommending government policies regarding income redistributional issues in Thailand.

The study begins with the estimation of money income distribution in 1963 and 1969 using the results of the 1962-1963 household expenditure survey and the 1968-1969 socio-economic survey as the main sources of data. The money income concept is then adjusted for underreported income, imputed rents, income in kind, net corporate savings and indirect taxes. The new, more comprehensive income concept is called "adjusted income," and both income concepts are used in computing the effective rates of taxes and expenditures of

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the entire fiscal system. These money and adjusted income distributions are called the "pre-fisc" income distribution, the pattern which would result if the government replaced the present tax and expenditure program with a proportional tax and expenditure program. The tax incidence is then interpreted as a reduction from, and the expenditure incidence an addition to, this pre-fisc income.

The estimation of tax incidence by income classes in 1963 and 1969 is carried out conventionally, that is, first certain shifting assumptions are decided upon, and, second, the absolute tax burdens are allocated to different income brackets according to certain allocation criteria. On the expenditure side, the accounting approach, where total expenditure benefits are assumed equal to total costs, is used to value the benefits. Expenditure data by functional categories disaggregated down to departmental levels help in the allocation of benefits to various income groups.

The incidence of taxation in Thailand expressed through effective tax rates in 1963 and 1969 shows a generally regressive pattern under a money income base, with the lowest income bracket bearing the highest relative tax burdens and the highest bracket the lowest relative tax burdens. Under the adjusted income base, however, the tax incidence becomes almost proportional due to the fact that the income levels of the lower income brackets under this income base are relatively much higher than the income levels under a money income base.

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Comparing the tax systems of 1963 and 1969, the latter appears to be slightly less regressive, thus less income de-equalizing than the former. Expenditure incidence assumes a pattern almost identical to tax incidence, that is, it is generally regressive under a money income base and almost proportional under an adjusted income base. The expenditure programs of 1969, however, appear to be much more regressive or pro-poor than those of 1963, this enabling the net benefits (expenditure benefits minus tax burdens) in 1969 to accrue to lower-income households relatively more than the net benefits in 1963. Therefore, while the net fiscal incidence pattern in 1963 ranged from slightly regressive to slightly progressive under money and adjusted income, respectively, the net fiscal incidence in 1969 was regressive under both income bases, indicating that fiscal programs in 1969 helped improve the distribution of income of the Thai households, while fiscal programs in 1963 left the distribution of income in that year more or less unchanged.

However, the degree of improvement in income equality (or a reduction in income inequality) from 1969 to 1963 was still very small. In terms of the Gini concentration ratio, which is used extensively in this study to evaluate the degree of changes in the patterns of pre-fisc, post-tax, post-benefit, and post-fisc income distribution, the post-fisc income distribution in 1969 improved by about 2.3 to 3.8 percent over the post-fisc income distribution in 1963. The government can effect this much improvement simply by imposing an extra

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2.5 percent tax on the income of the highest income bracket and distributing the tax revenue to the poorest income class. More important, the above conclusion that the fiscal programs in Thailand helped reduce income inequality is true only under the assumption that a budget deficit, which was present in both 1963 and 1969, adds directly to the income of households without their suffering any reduction in real income through possible price increases due to the existence of such a deficit. When this assumption is changed so that the budget deficit causes the price level to rise, which adversely affects each household equally, then the fiscal programs in both 1963 and 1969 could be shown to be income de-equalizing instead of income equalizing.

In conclusion, depending on certain assumptions concerning budget deficit, the Thai government could be shown to have contributed very little or none at all to the reduction in income inequality in the six years from 1963 to 1969. In the presence of the still considerable income disparities, policy changes are strongly advocated in the areas of basic tax reforms and increased specific and transfer expenditures.

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THE INCOME REDISTRIBUTIONAL EFFECTS OF TAXES AND PUBLIC EXPENDITURES IN THAILAND: AN INTERTEMPORAL STUDY

By

Medhi Krongkaew

A DISSERTATION

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

DOCTOR OF PHILOSOPHY

Department of Economics

1975

To my Children, Bee and Ben,

and my Wife, Kanlaya

I wish to
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My special
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to Dr. Ammar S.
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Finally, I wish to thank my family for their love, patience, and moral support both during the time I was with them and the time I was away. To them, this work is affectionately dedicated.

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CHAPTER I

INTRODUCTION

Purpose of the Study

The purpose of this study is to estimate the income redistributional impact of the government tax and expenditure policies in Thailand in 1963 and 1969 and between these two years. In the economics of public finance, this is basically known as a fiscal incidence study. However, the present research will differ from the conventional incidence study by placing emphasis more upon the interyear income redistributional effects than upon the effects of government fiscal activities within a single year.

There is a need to understand more about the extent to which governments have helped equalize the distribution of income among individuals or households through taxes and expenditures, especially in underdeveloped countries. In view of the fact that income distribution obviously has not become more equal in many developing countries, despite apparent increases in the national income and other indices of economic prosperity, certain questions have been asked: To what extent is the public sector responsible? Is there a deliberate government policy not to improve the distribution of income? Or is the government merely disinterested in or

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inactive concerning the income distribution issues? This study will attempt to answer these questions in the context of Thai government policy in and between the years 1963 and 1969.

Before proceeding to the scope and procedure of the present research, this chapter will discuss the background and rationale of the study. Following an account of the interest in income distribution in recent years, discussion will focus on the case for action being taken in regard to income equality or redistribution and the role of government in this issue.

Interest in Income Distribution

In recent years there has been a tremendous increase in interest in the economics of income distribution. This shift from a preoccupation with resource allocation and growth is quite timely because the problem of persistent and worsening inequality in the distribution income throughout the world has begun to cry for attention. An understanding of the nature of income distribution, the causes of maldistribution, and possible solutions is sorely needed.

Unlike the study of functional income distribution or the distribution of factor shares, the systematic study of personal distribution of income by size has a relatively recent history. Work began in the 1940s with a few studies in England and the United States. Soon after, an interest in underdeveloped economies began to emerge. The year 1954

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marked one of the earliest attempts by an economist to study income distribution in underdeveloped nations. In his Presidential Address to the American Economic Association in 1954, Simon Kuznets expressed his concern about the state of income distribution in developed as well as underdeveloped countries.[1] His pioneering study, which concluded that income distribution in underdeveloped nations was less equal (or more unequal) than that in developed countries, paved the way for further research by Irving Kravis in 1960 and Harry Oshima in 1962.[2] In 1963 Kuznets published another study dealing with the changes in income distribution through historical phases of economic development, which is now a classic in the field.[3]

Interest in income distribution lagged in the late 1960s, but re-emerged in the early 1970s. As if heralding a new era, the World Bank, which previously had been concerned only with the economic growth aspect of poor nations, conspicuously altered its attitude and policy and manifested greater interest in more equitable income distribution among those countries. This change was reflected in various speeches by Robert McNamara, President of the World Bank. In the years 1971, 1972 and 1973 McNamara made the following remarks:

> The state of development throughout most of the developing world is unacceptable... because hundreds of millions of people are living at levels of deprivation that simply cannot be reconciled with any rational definition of human decency....Current development programs are seriously inadequate because they are not significantly reducing the poverty which shapes and limits these lives. And though the matter is complex, basically we know why...the developing

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> countries are not moving decisively enough to reduce the severe social and economic inequalities among their own people.[4]
>
> Policies aimed primarily at accelerating economic growth, in most developing countries, have benefited mainly the upper 40 percent of the population and the allocation of public services and investment funds has tended to strengthen rather than to offset this trend.[5]
>
> When the highly privileged are few and the desparately poor are many...and when the gap between them is worsening rather than improving...it is only a question of time before a decisive choice must be made between the political costs of reform and the political risks of rebellion.[6]

These sentiments have been echoed more and more frequently by a growing number of economists,[7] and more studies on income distribution, especially in less developed countries, have been carried out.[8] Apart from the World Bank, other major international or national organizations, among them the International Labor Organization (ILO), the U. S. Agency for International Development (AID), the Brookings Institution, and the Economic Commission for Asia and the Far East (ECAFE), either have their own research programs on income distribution, support such studies, or are actively involved in actual income distributional policy programs. In a word, what began as a trickle in the 1950s and 1960s has become a flood in the 1970s.

The Case for Economic Equality

To some, it may appear that any effort to make the distribution of income and wealth more equal is intuitively a good thing, but this is by no means a universal sentiment.

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In fact, the income equality versus inequality argument has existed throughout the history of economic thought.

The pure labor theory of value, as formulated by Adam Smith and David Ricardo, justified inequality of income insofar as such inequality reflects differences in efforts measured by labor-time used in production. In other words, those who work longer and harder would receive a higher reward or profit. Karl Marx, however, argued that the profit or surplus value was an unearned increment which the capitalist did not earn by his own labor. A profit economy, therefore, leads to inequalities which are unfair by the standard of the labor theory of value.[9] The marginal utility theory of Alfred Marshall and A. C. Pigou, which assumed the cardinal measurement of utility, diminishing marginal utility and interpersonal comparison of utility, justified progressive taxation of the wealthy for redistributional purposes. The reasoning was that an adverse effect on the wealthy would be less than the positive benefits accruing to the poor. But this theory suffered a setback when most of its assumptions came under heavy attack from the new welfare economics.

The marginalist or neoclassical value theory has renewed the justification for economic inequality. According to this theory, if each person's income in a competitive market is equal to his marginal value product, then his income position is a result of his "productive contribution." However, strong opposition also has been voiced to this theory by various groups, particularly Marxists and radical economists.

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They argue that competitive conditions do not exist, and even if they did, production techniques could be varied so that the marginal product moves to haphazardly that no claim could be made that individual income is a reward for individual productive contribution.[10]

Purely historical or theoretical issues, however, are not the major concern here. Suffice it to say that the case for greater economic equality can be supported on both ethical and economic grounds. Inequality in the economic, social, or political structure would, to varying degrees, violate the principle that all men are entitled to equal opportunity. As Matthew Arnold said at the turn of the century, "on the one side, inequality harms by pampering; on the other by vulgarizing and depressing. A system founded on it is against nature, and in the long run, breaks down."[11] R. H. Tawney also has explored the danger of the "religion of inequality" associated with the distributive concepts of laissez-faire in his thoughtful book Equality.[12]

There are, of course, those who believe that measures to reduce inequality in market economies could have numerous undesirable effects.[13] H. G. Johnson, for example, maintains that the ethically motivated social concern about inequality should properly focus on inequalities of opportunity and on developing the knowledge and resources required to equalize them.[14] Milton Friedman believes that income inequality is inevitable due to different rewards for risk-taking and personal preferences.[15] John Rawls is more sympathetic to the

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problem. In his recent work on the concept of justice as fairness, he argues that although men cannot be perfectly equal in their income and wealth, at least everyone must have a strictly equal assignment of basic rights and duties. To Rawls, social and economic inequalities are just only if they result in compensating benefits to those less fortunate, in particular the least advantaged members of society.[16]

More immediately relevant to this study is the argument concerning economic growth versus economic equity. At least two points are at issue. First, many development economists fear that a policy which fosters a more equal distribution of income will conflict with the process of economic growth. They are concerned that such redistributive measures as progressive taxes on income and wealth in less developed countries will stifle the savings propensity of high income groups, which in turn will reduce capital formation and economic growth.[17] This need not always occur, however, since savings could come from the public sector as well as other unincorporated household sectors. It also can be argued, as do W. Paul Strassmann and W. G. Tyler, among others, that under certain conditions economic growth will depend on a more rather than less equitable distribution of income.[18] Empirically, W. R. Cline has shown that in many Latin American countries, although an income redistribution policy may have depressing effects on savings and growth of the economy, such effects are small and do not do irreparable damage to economic

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growth. On the contrary, the gains in terms of immediate and future income of the majority of people more than offset such growth sacrifice. Cline believes that the large majority of the population in Argentina, Brazil and Mexico would definitely be better off if the strategy of redistribution with slower growth were chosen over the option of a skewed distribution with somewhat faster growth.[19]

The second point involves the argument that one need not be concerned about economic inequality because it automatically will be reduced when the economy is more developed. Indeed, Kuznets has convincingly demonstrated that as an economy moves from the underdeveloped to the developed stage, inequality first worsens and then improves as the economy attains a higher level of development.[20] This conclusion seems to be historically true, but it is barren of practical meaning. It does not indicate how long the worsening in inequality will continue or when it will end for each particular economy; it does not address the problem of whether the majority of the population which suffers will tolerate this widening income gap.[21] Many economists believe that income distribution need not conflict with economic growth and should not be given a secondary role.[22]

The Government as Income Redistributor

In a world where the distribution of income is excessively unequal, how may such inequality be reduced? The various

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segments of society--the rich, the middle income strata, and the poor--can, of course, voluntarily redistribute their income among themselves. In the context of modern society, however, this is rather unlikely. The redistributive task probably will be left with the government, which is vested with the authority to govern and to regulate. According to the well-known theory of public finance propounded by R. A. Musgrave, the role of government may be divided into three functions: resource allocation, economic stabilization and income distribution.[23] The government performing this latter role not only will see to it that the economy's output is equitably (and efficiently) distributed (with the help of such fiscal tools as taxation and expenditure policies), but it also would ensure that the least advantaged, who have not benefited fully or adequately from the distribution process, will be aided through income transfers.

Not all governments can be expected to emphasize this distributive function as much as they do the allocative and stabilization roles. The classical arguments in the tradition of Adam Smith and his followers emphasized the defense of the nation, the maintenance of law and order, the regulation of business conduct, and the provision of public utilities. The view of government's role increased substantially with the introduction of Keynesian economics, as it was shown that the public sector is the best agent for controlling and managing aggregate demand and its resulting income and employment problems. Under modern capitalism, the nature and

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role of government has changed considerably. In an advanced capitalistic state such as the United States, it is often said that the government favors the modern corporate sector at the expense of consumers and workers, or the lower to middle income groups.[24] J. A. O'Connor, for example, argues that the two basic functions of the capitalistic government are to help in the accumulation of private capital and then to "legitimize" it by incurring social expenses in the form of projects and services which are required to maintain social harmony. The United States welfare system exemplifies programs designed chiefly to keep social peace among unemployed workers.[25] In the less developed capitalistic economy, the situation is very much the same. As T. E. Weisskopf has pointed out, most poor nations are characterized by a class structure in which power is highly concentrated among a small elite; such a structure in turn results in a state apparatus largely controlled by, and responsive to, the interests of that elite.[26] Although grossly oversimplified, this short description is undeniably accurate in regard to many, if not most, developing countries, including Thailand.

When the government tends to serve the interests of a powerful minority group or class, redistribution of income is unlikely to be a major policy of the country, if indeed there is such a policy at all. The government in such a setting usually facilitates the maximization of profits and the growth process in the modern corporate and industrial sectors and hopes that the increased wealth and income will "trickle

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down" to those less fortunate in the lower income brackets. Sometimes governments adopt a minimal transfer policy designed merely to keep the underprivileged mass content or at least docile. The rush to produce and to grow, while it helps in the accumulation of wealth, profits, and technological innovation, leaves a trail of problems, among them poverty and economic deprivation. The same situation applies equally for both developed and underdeveloped economies. If the above situation continues, a new policy or a new course of action may have to be undertaken along the lines suggested by John Kenneth Galbraith: The state may have to be freed from the economic interest and control of the business "planning system."[27]

Before proceeding, it must be re-emphasized that the point at issue is not the government's capability to redistribute income, but either its inefficiency or its unwillingness to do so. Therefore, changing either the government's administration or its policies is one of the most important first steps toward a more equitable distribution of income. There are at least two schools of thought concerning how the above should be accomplished. The radical school favors a complete uprooting of the existing capitalistic structure and its replacement with a new economic organization which has greater concern for equality of income and wealth. The liberal school, on the other hand, believes that it is possible to change the system or the policy in a gradual, less fundamental way. Although a government may be influenced or controlled by a small,

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wealthy elite, this stranglehold is not permanent. It is believed that it is possible to have a democratic government with both the intention and power to adopt deliberate redistributive policies. After all, this government is elected by the majority of the people, who are themselves on the lower rungs of the income distribution ladder. Both the radical and the liberal envision the same goal, but differ as to the strategy of change. And unless proven ineffective, the liberal way of change seems an attractive first choice to the existing problem.

Tax and Expenditure Incidence Studies

Assuming that a government is interested, willing, and able to use its fiscal power to redistribute income, it can do this in at least two direct ways. First, it can impose and collect taxes from individuals and households of various income sizes in such a way that the higher the income, the higher the taxes paid. This method is known as progressive taxation. Second, the government can, with part of its tax revenues, spend money in such a way that the benefits of such expenditures fall on the lower income brackets relatively more than on the higher income groups. These are known as regressive or "pro-poor" expenditures.[28]

In an effort to learn more about the impact of government fiscal policies on the size distribution of income, public finance economists have conducted what are called tax and expenditure incidence studies. These empirical studies quantify

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where the burden of taxes and benefits of government spending to various income classes fall under certain tax and benefit incidence assumptions. Due to conceptual and statistical difficulties, most research is done only on the tax side. A few researchers have attempted to do both, that is, to consider tax and expenditure incidence together and net out the difference of effects between the two across income classes. Termed a fiscal or budget incidence study, this is obviously a more complete and satisfactory way to learn about the redistributive impact of government policies.

Among early researchers into tax incidence in developed fiscal systems the following are most noteworthy: Mabel Newcomer, Helen Tarasov, R. A. Musgrave and Associates, and R. S. Tucker on the United States tax system,[29] and Tibor Barna, Findley Weaver, and A. M. Cartter on the British tax system.[30] The general conclusions drawn from their work were that the tax systems were generally progressive, thus redistributive in the desired direction (from the rich to the poor). During the 1960s, incidence studies in the United States became more widespread, and interest also shifted from tax incidence alone to complete fiscal incidence. This emphasis is evident in the work of O. H. Brownlee, W. Irwin Gillespie, N. M. Singer and the Tax Foundation.[31] Again, the net incidence result was found to be generally regressive or propoor.

In the area of less-developed fiscal systems, a few isolated studies were conducted in such Latin American countries

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as Guatemala, El Salvador and Venezuela in the 1950s,[32] but it was not until the mid-1960s that interest became widespread. By the 1970s, fiscal incidence studies in poor countries have become quite popular despite formidable statistical problems. Perhaps the income distribution issue is too important and urgent to wait for improvement in data collection and analysis. In the past ten years, no less than 20 developing countries have been the subject of tax and/or expenditure incidence case studies.[33] The results, however, have been mixed and inconclusive, depending on the characteristics of each country, on the availability and quality of data, and on the assumptions and techniques used in the studies.

While it is generally believed that a fiscal incidence study is an important first step in evaluating the role of the government sector in the matter of income redistribution which may lead to policies for a more equitable distribution of income, this is by no means generally agreed upon. R. M. Bird and Luc De Wulf, for example, while among the most prolific compilers of incidence studies in poor countries, are also ardent critics. Regarding tax incidence studies, Bird and De Wulf doubt the meaningfulness of the exercise and go so far as to say that the usual statistical calculations of tax burdens are virtually without merit as a basis for policy formation. On the expenditure incidence side, they question the validity of conventional approaches in allocating benefits to various income groups. All in all, they are skeptical about the usefulness of budget incidence studies for policy

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Obviously, Bird and De Wulf are correct in pointing out the myriad of conceptual and statistical problems involved, but they possibly are incorrect in prejudging the possible application of careful and conscientious studies in countries where grossly unequal distribution of income exists and poses an economic, social, or political threat. Among the least of the problems faced by researchers in developing nations is the overconfidence bred by having results stated in quantitative terms, as De Wulf has charged.[35] If anything, these results should be used only as another persuasive device, for many politicians require considerable evidence on certain policies. If the results from a fiscal incidence study could be of some use in making important decisions in an economy where the redistribution of income is an important objective, such a study should be encouraged. Despite its many shortcomings, an incidence study is still useful, as Musgrave has noted:

> This state of affairs [a tax incidence study] is far from perfect and subject to much improvement. Yet no apology is required. This kind of analysis is needed for the simple reason that distributional considerations are and should be an important factor in tax policy and that the economist's informed guess, based on explicit and reasoned hypothesis, is to be preferred...to the implicit and haphazard assumptions of the practical man.[36]

In summary, the income distribution issue is important, and a government can use its tax and expenditure policies to improve a maldistribution of income. The way to estimate the

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impact of such policies is through fiscal incidence studies, which indicate whether and to what extent the government has done its part in redistributing income and in which direction.

Fiscal Incidence Study in Thailand

This study is expected to yield quantitative estimates of tax burdens and expenditure benefits to Thai households, by income classes in 1963 and 1969. Although the main emphasis of this investigation is empirical, it is also within the scope of this research to hypothesize future developments. After considering many general facts and much supporting evidence, this study hypothesizes that the fiscal activities of the Thai government in 1963 and 1969 probably had few desirable redistributional effects upon the existing income distribution of households. In other words, the income positions of lower income groups relative to those of higher income groups are not expected to improve as a result of government fiscal policies. Several tentative reasons may be advanced to support this hypothesis.

Elites

As in many other underdeveloped countries, the socio-economic structure of Thailand exhibits what T. E. Weiskopf would call an elite-centered system--a small elite group influences or controls government policy. Therefore, it is unlikely that any pro-poor redistributive policy will be allowed to materialize or to cause real deterioration in the income positions of the upper-income, or elite groups.

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Bureaucracy

Thailand's bureaucratic system is generally regressive and inefficient. This is also true of the tax system and its administration. The tax system relies excessively on indirect taxes as a major source of revenue because these are relatively easy to collect. Enforcement of the existing direct tax law is weak, giving rise to widespread non-compliance and tax evasion. The Thai tax system is also noted for its lack of property, estate or inheritance taxes. Therefore, it should not be surprising if the tax burden is shown to fall relatively more heavily on the poor than on the rich.

Expenditure Policies

The expenditure policies of Thailand can be described as either unplanned, uncoordinated or haphazard. Moreover, expenditures aimed at improving the social welfare of the poor comprise only a small portion of the total budget. Coupled with inefficient administration, the benefits from these expenditures will prove to be less redistributive than they should be, and a portion is simply wasted ineffectually.

Development Policy

The government's development policy is decidedly pro-growth, with little or no concern being given to equity. For example, in the early 1960s the government launched an industrial promotion campaign aimed at encouraging foreign as well as domestic investment. The incentives were overwhelmingly

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attractive: no tax on profits for five years, reduced import duties on raw materials, certain immigration privileges for foreign personnel, and so on. Yet, during this period labor legislation regulating minimum wages, hours of work, other employment benefits and compensation was virtually nonexistent. While the promoted firms experienced rapid success, the worker's income position was only slightly improved.

Banking

In areas in which the government should exert its influence, it does not do so. The banking system is an example. While one of the most important factors in promoting agricultural production in Thailand is the availability of agricultural credit, this is, ironically, one of the areas most neglected by the government. The Bank of Agriculture and Agricultural Cooperatives, the only government-owned bank dealing directly with agricultural credits, is much too small. Private commercial banks are uninterested in giving agricultural credits; in 1963 and 1969 for example, the percentage of loans to the agricultural sector by commercial banks was only 3.9 percent and 2.8 percent of total loans, respectively.[37] The government could have imposed a rule that a certain percentage of such loans must be channelled to the agricultural sector, but this was never done.

Summary

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regarding improvement in the distribution of income in Thailand can be expected to be negligible, the information tends to lend credence to the hypothesis that has been advanced. Empirical results presented later in this study will either verify or refute the hypothesis.

Procedure of the Study

The procedure used in this study is similar to that followed in other fiscal incidence studies in most respects. This general procedure is outlined below.

General Procedure

The usual procedure followed in most fiscal incidence studies can be viewed as a five-stage process. First, an estimate of income distribution of individuals or households must be obtained or developed for use as the income base upon which the tax and expenditure incidence is computed.

Second, the tax incidence by income class is estimated by allocating the actual tax burdens to the different income classes that contributed such revenues to the government. This necessarily involves certain tax shifting assumptions in order to allocate the tax burdens.

Third, the estimation procedure for expenditure incidence is similar to that for tax incidence. Actual expenditures are allocated to actual or expected beneficiaries by income classes. In many expenditure categories, the beneficiaries are specifically identifiable; in others, especially those of a public good nature, identifying the beneficiaries

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Fourth, the absolute tax burdens and expenditure benefits (that is, the burdens and benefits in money terms) by income classes are then expressed as percentages of respective income levels to arrive at the relative incidence of taxes and expenditures by income classes. These are often called effective tax rates and effective expenditure rates, respectively.

Fifth, the net fiscal incidence or the effective fiscal rate is the result of subtracting the tax incidence from the expenditure incidence of the same income class. Overall, this rate will show whether or not a particular income group is a net gainer (positive rate) or net loser (negative rate) from government fiscal activities. A more egalitarian redistributional fiscal activity would generally result in positive net fiscal incidence in the lower-income classes and negative net fiscal incidence in the upper-income classes.

Specific Procedure

The foregoing has described the general procedure to be used in this study, which is the one used in most other fiscal incidence studies. However, the methodological procedure used here differs in some respects from that used in other research, and these differences deserve special mention.

First, this study is an intertemporal, not a single-period, incidence study. Instead of selecting one reference

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year and assessing the impact of government taxes and expenditures for that year, which is the traditional way, this research selects two reference years, estimates the tax and expenditure incidence using the same assumptions and allocation rules for both years, and compares the fiscal impact of each year on each corresponding income distribution. The obvious advantage of this method over the traditional one-period method is that, in addition to the incidence pattern pertaining to the year in question, it is possible to know the change in that pattern over time. Moreover, the adoption of this two-period method substantially weakens one criticism against traditional studies, that is, that they assume, in effect, that the existing income distribution will remain the same in the absence of the government.

Second, rather than use one income concept as the base of the tax and expenditure incidence, two income concepts are used in this study. One is money income, which includes only household receipts in cash form, and the other is the adjusted income concept, which includes not only money income, but also nonmoney income, imputed income, and all other incomes which can be identified and calculated.

Third, the taxation and expenditure of the central government will be comparable in both reference years. This will be done by making income groupings, tax categories, and expenditure classifications the same for both years.

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Limitations of the Study

A caveat must be stated regarding the interpretation of the study's conclusions. Although the fiscal incidence is stated with mathematical precision, and the study is, for the most part, quantitative in nature, the reader should not consider the results to be an exact measure of tax burdens or expenditure benefits. At best, this incidence estimate should be taken as only a careful approximation of the effects of government fiscal activities on income distribution.

Theoretically, the methodology of a fiscal incidence study is still not fully developed. Many conceptual problems, especially those concerning expenditure incidence, either have not been resolved or must be dealt with in a less than satisfactory way. In addition, the availability of statistical information in Thailand is far from ideal. Many statistical series must be "created" using logical assumptions and available data. Also, to keep the study within manageable proportions, three major limitations have been imposed on its scope.

First, the study takes into account only the income distributional effects of government taxes and expenditures; it does not consider the potential distributional effects of such nonbudgetary policies as price controls, land reform, minimum wage legislation, interest rate regulation, population control measures, foreign exchange rates, and other micro-or macroeconomic policies.

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Second, the study considers only the distributive impact of fiscal activities at the national level; it does not break down the impact into regional or provincial levels or into classifications such as rural/urban, agricultural/non-agricultural, and so on. Also omitted is the incidence of certain fiscal activities of local governments and of foreign aids and loans.

Third, as is well known, this type of incidence study represents partial equilibrium analysis, where the fiscal impact of a certain period is restricted to that period only, discounting previous developments as well as future repercussions. Furthermore, the study is only concerned with the primary or direct impact of fiscal policies; all secondary or spill-over effects (externalities) are ignored.

Some explanation is appropriate as to why such limitations are necessary. First, the study is confined to government taxation and spending policies in order to keep the research as compact as possible. To include other nonbudgetary policies would be desirable but it would be impossible with constraints of time and resources. In fact, the income distributional impact of these nonbudgetary policies would represent another entire area of study.

Second, although a series of income distribution data could be broken down into four geographical regions (North, Central, Northeast and South) and into municipal and non-municipal subcategories within each region, the study is confined to the national level because no tax and expenditure

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data are available which are broken down on the same basis; only the national data are available. Therefore, these taxes and expenditures cannot be allocated at any other level, unless, of course, one is willing to make risky assumptions as to which parts of the taxes and expenditures may be attributed to the several regions. As for the exclusion of certain local government fiscal activities, these are small, fragmented entities, and they tend to exist on a quid pro quo basis, that is, the services they provide are available only to those who pay for them. As a result, the income distributive effects are likely to be neutral. However, central government grants-in-aid to these local governments were considered in this study because they were part of general government expenditures.

Finally, it is recognized that the true distributive effects of a fiscal policy can be measured only through a general equilibrium analysis which takes into account all distributive components and reactions. Given the present state of the art, however, it is not conceivable that one could actually measure all such effects. The most that can be done at the present time is to use partial equilibrium analysis, which considers only primary and direct impact, other things remaining constant or neutral. De Wulf, a critic of fiscal incidence studies, has realized this problem:[38]

> Until general equilibrium models are built which allow researchers to trace the full effects of wholesale budget substitution on income distribution, partial incidence studies are much more reliable guides than system incidence studies.

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Plan of the Study

The main reason for selecting 1963 and 1969 as the two reference years was that these were the only two years for which reasonable data for estimating the income distribution in Thailand were available. It is possible to stretch the reference interval farther than six years by making adjustments in the income data, but there is no valid reason for such an expansion at the expense of abandoning two original series of data. Moreover, the 1963 tax and expenditure data, although imperfect, are decidedly better than those for 1962 and earlier years. In addition, the details of some data after 1969 were unavailable. Therefore, the choice of 1963 and 1969 appears to serve the purpose of this study well.

The remainder of this study is divided into five chapters. Chapter 2 will be concerned with estimating the income distribution of Thailand in 1963 and 1969. Different income concepts will be explored and adjustments made so as to have a more complete income base for the study. Chapter 3 will consider the tax incidence in Thailand in 1963 and 1969, and Chapter 4 will compute the incidence or benefits of public expenditures for these years. Chapter 5 will consolidate Chapters 3 and 4, and the net results of the entire effects of the Thai fiscal system for the two reference years will be estimated. In this chapter, attention will be given to such matters as deficit financing, which have been neglected in many incidence studies, but which will receive

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relatively more attention here. From this chapter, it will be possible to determine whether any change occurred in the distribution of income between the two reference periods as a result of government budgetary policies, or whether the results substantiate the hypothesis that the Thai government has done little or nothing in redistributing income among various households in the desired direction, that is, from the upper to the lower income classes.

In the last chapter, the substantive content of the whole study will be summarized, certain policy implications for reducing income inequality will be discussed, and future research directions will be indicated.

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FOOTNOTES

[1]See Simon Kuznets, "Economic Growth and Income Distribution," American Economic Review, 45 (March, 1955), pp. 1-28. Herafter, by income distribution is meant income distribution by size unless otherwise specified.

[2]Irving B. Kravis, "International Differences in the Distribution of Income," Review of Economics and Statistics, 42 (November, 1960), pp. 408-416; Harry T. Oshima, "The International Comparison of Size Distribution of Family Incomes with Special Reference to Asia," Review of Economics and Statistics, 44 (November, 1962), pp. 439-45.

[3]Simon Kuznets, "Quantitative Aspects of Economic Growth of Nations: III, Distribution of Income by Size," Economic Development and Cultural Change, 2 (January, 1963), pp. 1-80.

[4]Robert McNamara, "The Environmental Dilemma" in War on Hunger, (Washington, D. C.: U. S. Department of State, December, 1971) as quoted in Richard Weisskoff, "Income Distribution and Economic Growth in Puerto Rico, Argentina, and Mexico," Review of Income and Wealth, 16 (December, 1970), p. 327.

[5]Robert McNamara, "Address to the Board of Governors," IBRD/IMF Annual meeting, Nairobi, September 24, 1973, p. 11.

[6]Idem., "Address to the Board of Governors" IBRD/IMF Annual meeting, Washington, D. C., September 25, 1972, p. 15.

[7]One of the most forceful arguments in favor of equity-based development policy is found in Mahbub ul Huq, "Employment and Income Distribution in the 1970s: A New Perspective," a statement prepared for the Society for International Development 12th World Conference, Ottawa, May 16-19, 1971.

[8]See, for example, Irma Adelman and Cynthia Taft Morris, "An Anatomy of Patterns of Income Distribution in Developing Nations," paper prepared for USAID, Washington, D. C., February, 1971; Felix Paukert, "Income Distribution at Different Levels of Development: A Survey of Evidence," International Labour Review, 108 (August-September, 1973), pp. 97-125; Irving B. Kravis, "A World of Unequal Incomes," The Annals of the American Academy of Political and Social

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Science, 409 (September, 1973), pp. 61-80; U. N., Economic Commission for Asia and the Far East, Interregional Trade Projections, Effective Protection, and Income Distribution: (Bangkok, 1972); Montek S. Ahluwalia, "Income Inequality: Some Dimensions of the Problem," Redistribution with Growth, Hollis Chenery et al. (London: Oxford University Press, 1974), Chapter 1.

[9]See Walter A. Weisskopf, "The Dialectics of Equality," The Annals of the American Academy of Political and Social Science, 409 (September, 1973), p. 167.

[10]Edward J. Nell has shown that one way to prove this is to retrace the usual neoclassical exposition of the marginal productivity theory. Start with the income identity in real terms:

$$Y = wN + rK \qquad (1)$$

where Y is output; w, the wage; N, the number of workers; r, the rate of profit; and K, the total capital stock. Divide (1) by K:

$$y = wn + r \qquad (2)$$

where y equals Y/K and n equals N/K. Differentiate:

$$dy = ndw + wdn + dr \qquad (3)$$

from which it follows that

$$w = dy/dn \qquad (4)$$

or the wage will equal the marginal product of labor if and only if -n equals dr/dw, that is, all sectors in the economy must have the same capital to output ratios which is a most unlikely circumstance. In general, with a given technique or if the techniques vary, the wage may not equal the marginal product of labor because the real wage rate and profit rate will move haphazardly as the relative scarcity of labor to capital varies. See Edward J. Nell, "The Fall of the House of Efficiency," The Annals of the American Academy of Political and Social Science, 409 (September, 1973), pp. 102-111. For a larger discussion on this "reswitching" point, see George C. Harcourt, Some Cambridge Controversies in The Theory of Capital (Cambridge: Cambridge University Press, 1972).

[11]Matthew Arnold, Lecture on "Equality" in Mixed Essays, ed. 1903, p. ix, quoted by R. H. Tawney, Equality 4th ed., (London: George Allen and Unwin, 1964), p. 33.

[12]R. H. Tawney, supra.

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[13]See Bertrand de Jouvenel, The Ethics of Redistribution (Cambridge: Cambridge University Press, 1951) and Milton Friedman, Capital and Freedom (Chicago: University of Chicago Press, 1962).

[14]Harry G. Johnson, "Some Microeconomic Reflections on Income and Wealth Inequalities," The Annals of the American Academy of Political and Social Science, 409 (September, 1973), p. 60.

[15]Milton Friedman, "Choice, Chance, and the Personal Distribution of Income," Journal of Political Economy, 61 (August, 1953), 277-90.

[16]To further elaborate upon Rawls' view, two sets of goods X and y, may be conceived in a consumer's utility function. X is a set of primary social goods where liberty and moral worth (basic rights and duties) are often cited as examples, and y is a set of ordinary commodities for physical consumption and enjoyment. Rawls' system requires that x must be inherently equal for everyone in the society in the sense that none in society has more than the least endowed, and that x takes precedence over y in a lexicographical manner, that is to say, an individual with (x_2, Y_1) is always better off than with (x_1, Y_2) no matter how small $(x_2 - x_1)$ or how large $(Y_2 - Y_1)$ is.

The inequality in income and wealth or difference in Y_2 and Y_1 in the above model is "just" only when it is agreed upon or sanctioned by a democratic approval within a hypothetical "original situation," that is, the situation where no one has a preconceived idea of where he stands in the society or in Bronfenbrenner's interpretation, none knows either his relative standing in such attributes as IQ and physical stamina or what the relative social standing of his particular race, sex, religion or age group may be. Then, the next requirement in Rawls' system is that the least advantaged members of society deserve to be compensated first and foremost. See John Rawls, A Theory of Justice (Cambridge, Harvard University Press, 1971), p. 14, 60, 302-3, passim. See also Martin Bronfenbrenner, "Equity and Equality," The Annals of the American Academy of Political and Social Science, 409 (September, 1973), pp. 9 - 23.

[17]One of such view is found in W. Arthur Lewis, The Theory of Economic Growth (London: Allen and Unwin, 1955).

[18]See W. Paul Strassmann, "Economic Growth and Income Distribution," Quarterly Journal of Economics, 70 (August, 1956), pp. 425-40; William G. Tyler, "A Model of Income Distribution and Economic Development," Weltwirtschaftliches Archiv, (1973), pp. 321-36.

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[19]William R. Cline, Potential Effects of Income Redistribution on Economic Growth: Latin American Cases (New York: Prager, 1972).

[20]Kuznet, "Quantitative...," pp. 78-80.

[21]An interesting analysis of this tolerance level is found in Albert O. Hirschman, "The Changing Tolerance for Income Inequality in the Course of Economic Development," Quarterly Journal of Economics, 87 (November, 1973), pp. 544-66.

[22]However, W. R. Cline in his recent article contends that while the orthodox fear of a decline in the savings rate with equalization has been found empirically doubtful, the unorthodox "structuralist" hope that redistribution would stimulate growth has also been found dubious. See his "Distribution and Development: Survey of Literature," Journal of Development Economics, 1 (February, 1975), pp. 359-400.

[23]Richard A. Musgrave, The Theory of Public Finance (New York: McGraw Hill, 1959).

[24]See Ralph Miliband, The State in Capitalist Society (New York: Basic Books, 1969); Paul Baran and Paul Sweezy, Monopoly Capital (New York: Monthly Review Press, 1966); Richard C. Edwards, Michael Reich, and Thomas E. Weisskopf, The Capitalist System (Englewood, N. J.: Prentice-Hall, 1972); James A. O'Connor, The Fiscal Crisis of the State (New York: St. Martin's Press, 1973); and somewhat in different context, J. Kenneth Galbraith, The New Industrial State, 2nd ed., rev. (Boston: Houghton-Mifflin, 1971).

[25]O'Connor, pp. 6-7.

[26]Thomas E. Weisskopf "Capitalism, Underdevelopment, and the Future of the Poor Countries" in Jagdish Bhagwati, ed., Economics and World Order (London: MacMillan, 1972), p. 40.

[27]John Kenneth Galbraith, "Power and the Useful Economist," American Economic Review, 63 (March, 1973), pp. 10-11.

[28]Some authors use the word "progressive expenditure" to mean the expenditure which benefits the lower income groups relatively more as the income level falls. Therefore, this has the same meaning as "regressive expenditure" used in this study. This latter choice of word is preferable because it is consistent with the treatment on the tax side.

[29]Mabel Newcomer, "Estimates of the Tax Burden on Different Income Classes": Studies in Current Tax Problems (New York: Twentieth Century Fund, 1937), pp. 1-52; Helen

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[30]Tibor Barna, The Redistribution of Incomes Through Public Finance in 1937 (Oxford: The Clarendon Press, 1945); Findley Weaver, "Taxation and Redistribution in the United Kingdom," Review of Economics and Statistics, 32 (August, 1950), pp. 201-13; Allan M. Cartter, The Redistribution of Income in Postwar Britain (New Haven: Yale University Press, 1955).

[31]O. H. Brownlee, "Estimated Distribution of Minnesota Taxes and Public Expenditure Benefits," Studies in Economics and Business No. 21 (Minneapolis: University of Minnesota, 1960); W. Irwin Gillespie, "Effects of Public Expenditures on the Distribution of Income," in Richard A. Musgrave, ed. Essays in Fiscal Federalism, (Washington, D. C.: The Brookings Institution, 1965), pp. 122-86; Neil M. Singer, "Income Redistribution through the Federal Budget in 1959," unpublished Ph.D. dissertation, Stanford University, 1965; The Tax Foundation, Tax Burdens and Benefits of Government Expenditure by Income Class, 1961 and 1965 (New York: The Tax Foundation, 1967).

[32]John Adler, E. R. Schlesinger, and Ernest Olson, Public Finance and Economic Development in Guatemala (Stanford: Stanford University Press, 1952); Henry Wallich and John Adler Public Finance in a Developing Country: El Salvador--A Case Study (Cambridge: Harvard University Press, 1951); Carl S. Shoup et al., The Fiscal System of Venezuela: A Report (Baltimore: The John Hopkins Press, 1959).

[33]These countries include: Argentina, Brazil, Chile Colombia, Jamaica, Panama, Peru, Puerto Rico, Surinam, India, Greece, Indonesia, Kenya, Lebanon, Malawi, Pakistan, Philippines, Tanzania, Turkey, and West Malaysia. For comprehensive surveys on tax, expenditure and budget incidence studies in less developed countries see Richard M. Bird and Luc De Wulf, "Taxation and Income Distribution in Latin America: A Critical Review of the Empirical Studies" International Monetary Fund Staff Papers, 23 (November, 1973), pp. 639-682; L. De Wulf, "Fiscal Incidence Studies in Developing Countries: Survey and Critique," IMF Staff Papers, 22 (March, 1975), pp. 61-131; see also Jacob Meerman, "Fiscal Incidence in Empirical Studies of Income Distribution in Poor Countries" AID Discussion Paper No. 25, (Washington, D. C., December, 1972).

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[34]Bird and De Wulf, p. 663 and De Wulf, passim.

[35]De Wulf, p. 48.

[36]Richard A. Musgrave. "Estimating the Distribution of the Tax Burden" Chapter 2 in Problems of Tax Administration in Latin America: Papers and Proceedings of a Conference held in Buenos Aires, Argentina, October, 1961 (Baltimore, 1965), p. 31.

[37]Thailand, Bank of Thailand, Monthly Bulletin, December, 1964, and December, 1970.

[38]De Wulf, p. 2.

[39]The two sources of data are (1) Thailand, National Statistical Office, Reports of the Household Expenditure Survey, 1962-1963, 7 vols. (Bangkok, 1968); (2) Idem., Report of the Socio-Economic Survey, 1968-1969 (Bangkok, 1973).

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CHAPTER II

THE DISTRIBUTION OF INCOME IN THAILAND: 1963 AND 1969

The object of a fiscal incidence study is the computation of the effective rates of tax burdens and public expenditure benefits. To do so, an income base is needed as a denominator for the values of the tax burdens and expenditure benefits. It is obvious that the selection of an income base is very important; if an incorrect or inaccurate base is used, the pattern of fiscal incidence could be distorted. Therefore, a precondition for a successful fiscal incidence study is the determination of a proper income base for each income class.

But the determination of an income base by size is not at all easy. It usually involves many conceptual difficulties, such as a definition of income, the difference in income received at different periods, the selection of the individual or the family as a unit of analysis, and so on. In an underdeveloped country such as Thailand, the problem is even more serious; in addition to the familiar conceptual problems, the necessary statistical data often do not exist and if they do, they often are unreliable.[1]

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Conceptual and Statistical Problems in Estimating Income Distribution

The two major conceptual problems in an income distribution study are the concept of income and the selection of the income recipient unit. Choosing what is to be included as income is not always simple. Income can exist in many forms and may be differently defined in various settings. Most economists, however, prefer the definition of Henry C. Simons, who defined personal income as "the algebraic sum of (1) the market value of rights exercised in consumption, and (2) the change in the value of the stock of property rights between the beginning and the end of the period in question."[2] In other words, it is the sum of consumption plus the change in net wealth. A similar definition was proposed by R. M. Haig: Income is "the money value of the net accretion to one's economic power between two points in time."[3] According to these definitions, income is more than the flow concept of money income; it also includes, among other things, income in kind, imputed rental income, corporate savings, transfers and gifts, and capital gains.

In national income accounting, where terminology is more or less standardized, aggregate income is defined as the payments, disbursed or accrued, to factors of production for services rendered in a given period. Personal income includes all payments which are actually disbursed to the factors of production plus various kinds of transfers, but corporate savings are excluded because this kind of income is

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accrued, not disbursed. Disposable income is that portion of personal income remaining when all personal taxes have been paid. Thus, in the area of income taxation, the concept of taxable income may be very narrow or very broad depending upon a nation's tax law. In income distribution studies, the concepts used are not uniform but depend upon the availability of data and the aim or preference of the investigator. Assuming that the statistical data pose no problem, if one wanted to measure the distribution of rewards for employment in different occupations, then income defined as earnings before taxes would be the most relevant concept. If one wanted to determine the relationship between the distribution of income and earning abilities, then all types of compensation in money and in kind would be more appropriate. For other purposes, there are other income concepts.

As noted earlier, in addition to the problem of choosing an appropriate income concept, there is the problem of selecting the income recipient unit. The choice of the individual as the unit of study is desirable if attention is focused on the relationship between the distribution of productive earnings and current output or the distribution of income and earning abilities. If the purpose is to examine the changes in consumption and saving as a result of certain policies, or to measure the changes in the "welfare" of the consumers, then the family unit is more appropriate. However the type of unit may be determined by the availability of data. If income data are obtained from a population census,

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then the recipient unit is likely to be the individual; of they are obtained from household surveys, the recipient unit is likely to be the family. It is possible, of course, to study both units if the data permit, but the outcome of the analysis would be different.

A point referred to above was the statistical source for estimating income distribution. The four data sources most often used by researchers are: (1) a population census, (2) income tax returns, (3) results from sample surveys, and (4) composite sources based on national income data and other related information.

Let us first consider the population census. If the census is complete, and if it contains information on the incomes of individuals, it is probably the best data source for computing income distribution. But in many countries, particularly the less-developed, population census data often are incomplete and, as a rule, almost are devoid of the needed information on income. In such cases, the census would only be useful in providing information on the size of the population or the number of households.

Income tax returns also could be used to compute the distribution of income of individuals, but these alone are insufficient. In most countries the taxable income concept is usually narrow and is likely to omit persons in the lower-income brackets. Other income elements might escape measurement through such tax loopholes as exemptions, preferential

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tax treatment, and capital gains, not to mention the tax evasion which is pervasive in less-developed nations. Therefore, the taxable income base per se is inadequate.

Household sample surveys, the third source of data, could be household income surveys or household expenditure surveys including questions on family income. The personal income concept used could follow that of Simons and Haig as closely as one wished. The surveys also could be designed to illuminate the structure of the very poor or the very wealthy. What is most crucial, however, is the manner in which the survey is conducted, rather than its design. Often the surveying agency is constrained by a low budget, which results in too small a sample size, by limited manpower, incompetent interviewing, and a lack of cooperation from the households. Nevertheless, the survey method is still the most flexible.

Finally, composite sources have no single origin. The process of compiling such information normally would begin with finding the reference levels of national income broken down into income from wages and salaries, self-employed income, transfer payments, income from property, and so on. Then the distribution of each of these separate categories would be estimated using information from other sources. For example, the distribution of salaried income could be estimated from industrial and business censuses or labor surveys; self-employed income, in the case of most urban households, from tax records, or for rural households from an

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agricultural census; and transfer income from social security registers. The advantage of this type of data is that it avoids the underreporting of most income classes, especially the higher income brackets, which is a problem in household sample surveys and tax return data. Its greatest disadvantage, however, is that data from different sources may be incompatible and adjusting separate income groups is thus difficult.[4]

Previous income distribution studies in both developed and underdeveloped countries most frequently have used as a single data source the household income and expenditure survey. This survey alone may be used or it may be supplemented by other sources, such as tax data, to confirm the accuracy of the distribution of the top income groups. One reason for the popularity of this method may be that it is relatively easier to gather information about income distribution through surveys than through other collection methods. Both the accuracy and reliability of the results could be improved through better technical and administrative management and increased budgets. True, the problem of sampling error always is present, but its advantages are sufficient to offset this drawback. Besides, sampling errors can be reduced through sound statistical design and execution of this survey.

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In Thailand, there is no choice among alternatives: The only data available are from household surveys. As of 1974, four national household expenditure (and income) surveys had been conducted by the National Statistical Office (NSO). The first was conducted during 1958, the second between 1962 and 1963, the third during 1969, and the fourth in 1971. Only the 1962-1963 and 1969 surveys were usable here; the 1958 survey was too small and was limited to a few nonrandomly selected municipal areas, and the results of the 1971 survey were not yet published.

Other researchers have made estimates of or conducted studies on the distribution of income in Thailand. These efforts will be reviewed briefly, and their weaknesses and the need for a new study will be discussed.

Past Studies of Income Distribution in Thailand

Until early 1973, only four scholars were seriously involved in the study of income distribution in Thailand and had published their findings in some form. Harry T. Oshima, whose article was published in the October 1970 issue of The Malayan Economic Review, compared the sources of income inequality in Thailand with those of other Asian countries.[5] Although not an exhaustive examination, this study provided a penetrating insight into the relationship between income inequality and economic growth in Thailand.

Udom Kerdphibule of Kasetsart University was probably the first Thai scholar to undertake an intensive study of the

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distribution of income in Thailand. As a member of an Economic Commission for Asia and the Far East organized to study the income distribution of the region in 1971, he was responsible for the report on Thailand. His work first appeared in the 1971 Economic Survey of Asia and the Far East, and later in Volume III of another Economic Commission for Asia and the Far East publication, Interregional Trade Projection, Effective Protection, and Income Distribution, published in 1972.[6] In December of the same year, Kerdphibule wrote another article using the same material from the Economic Commission for Asia and the Far East entitled "Income and the Distribution of Income of the Agricultural Sector," it was published in the Thai Journal of Agricultural Economics (in Thai).[7] Kerdphibule should be much credited for his pioneering efforts, but his work also had many deficiencies: His analysis, for the most part, was sketchy; certain methodologies were questionable; and there were a few careless mistakes.[8] Therefore, the conclusions reached, if not misleading, must be interpreted with caution.

In August, 1972, William A. McCleary of Thammasat University published his study on income distribution in Thailand in a Thammasat University Discussion Paper.[9] His emphasis was not so much on income estimation and its adjustment as on the sources and magnitudes of income changes between 1962-1963 and 1968-1969, using the existing income distribution series. His work was more or less an extension and expansion

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Finally, in an ongoing project, Oey Astra Meesook, also of Thammasat University, is attempting to give special attention to the consistency in the estimation process and to incorporate into the money income concept certain income adjusting elements, especially income in kind. When completed, her findings will add substantially to the scant literature on income distribution in Thailand.[10]

As there exists no systematic and adequate account of income distribution in Thailand, this study will attempt to reestimate income distribution in 1963 and 1969. Hopefully, by avoiding previous pitfalls and by emphasizing the completeness and consistency of the estimates, these new estimates will provide much improved income bases for the subsequent incidence study.

Income Distribution in 1963

Nature of Data and Method of Study

As mentioned earlier, the main source of data on income distribution in 1963 is the 1962-1963 Household Expenditure Survey.[11] The results were published in seven volumes, one for the whole country, one for the municipal sections of Bangkok and Thonburi, and one for each of the five regions: the north, northeast, central plain, east, and south. The survey further classified each region into towns and villages, with the exception of Bangkok and Thonburi, where only the

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towns were surveyed. The two main objectives of the survey, were, first, to study the income, expenditure, and savings patterns of noninstitutional households and, second, to provide information on the relative importance of various goods and services in household spending patterns to be used as a basis for calculating a consumer price index.

Sample households were selected by a three-stage stratified sampling technique. The first stage selected the amphurs or districts from over 400 amphurs in the country, the second stage the city blocks or villages from the chosen amphur, and the third stage the final households from the chosen city blocks and villages. At each stage, sample units were selected systematically with probabilities proportional to size; the household information from the 1960 population census was used for this purpose. The total sample selected, 6,420 households, was divided into 2,310 households in towns and 4,120 households in villages.

The unit of study was the economic family, defined either as a single person who was financially independent of other family groups or as a group of persons who lived and ate together, pooling their income and drawing from this common fund to pay for food, housing and other living essentials. One or more of these families living together formed a "household." In other words, there could be more than one economic family in a household, although almost all households were of the one-family type.

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The income concept used was total family money income, which included wages and salaries, profits from self-employment or family enterprises, income from rent and from such sources as pensions and annuities, interest, dividend and brokerage fees, money received through public and private assistance, lottery prizes and net winnings from gambling, and the value of food received as pay.

The general methodology used in estimating income distribution in 1963 was as follows: the frequency distribution of families as recorded in different income classes in each location and each region was taken from the survey, and it was assumed that these families were representative of the entire country. After the mean or average income of each class was determined, the distribution of income was obtained by weighing the average income in each income class with the corresponding household share. This sample distribution could be further "blown up" by multiplying the average income in each class with the number of actual families classified into corresponding income classes. The multiplication would not change the pattern of income distribution; rather, it would give the level of the total income of the whole country. To this total (money) income, various adjustments would be made in this study to make it as complete as possible.

The Income Distribution Estimates

Two pertinent types of information concerning family income distribution were gathered in the 1962-1963 survey.

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First, the frequency distribution of families in all regions was obtained and was classified into ten income classes. Second, the distribution of average monthly incomes for all regions, except Bangkok and Thonburi, was classified into five income classes. This information is presented in Tables 2.1 and 2.2.

At first glance, it would seem that the distribution of income could be easily estimated simply by multiplying the average monthly income in Table 2.2 with the relevant corresponding percentage share of households in each income bracket in Table 2.1, after reducing the income classes in Table 2.1 from ten to five. In fact, the matter is not so simple because of the inconsistent use of the family income concept by the NSO. In the survey, both the annual and monthly income questions were asked separately, resulting in two sets of different income figures, both of which were published without adjustment. Whereas the families were classified into annual income classes as in Table 2.1, the average monthly income for each of these classes was not obtained by converting the average annual income into the average monthly income; the latter figure was the one obtained directly from the questionnaires. In other words, the NSO used the annual income data to group the distribution of families, and then used the monthly income data from the survey responses to compute the average monthly income for each of these family classes as the average monthly income figure. As a result,

Table 2.1--Percentage Distribution of Families by Income Classes from the 1962-1963 Household Expenditure Survey

Table 2.1--Percentage Distribution of Families by Income Classes from the 1962-1963 Household Expenditure Survey

	Total Percent	Income Classes (Baht)									
		Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000-23,999	24,000-29,999	30,000-35,999	36,000-47,999	48,000-59,999	60,000 and over
Whole Kingdom	100.0	48.4	20.8	19.5	5.7	2.4	1.0	0.7	0.6	0.3	0.6
Bangkok-Thonburi	100.0	4.8	15.0	31.7	17.4	10.3	5.5	4.0	3.8	2.2	5.3
Towns:	100.0	17.7	18.7	34.2	14.7	5.8	2.7	2.2	1.7	0.9	1.4
Northeast	100.0	16.8	19.7	32.5	14.7	6.4	2.7	2.8	1.9	0.9	1.6
North	100.0	33.4	19.8	27.0	10.4	3.3	1.8	0.6	1.8	0.8	1.1
East	100.0	13.2	18.0	37.0	14.5	8.3	2.7	2.3	2.0	1.2	0.8
Central	100.0	11.3	18.7	41.2	14.1	4.6	3.6	3.2	1.4	0.5	1.4
South	100.0	9.3	16.3	34.6	21.4	8.7	2.6	2.2	1.7	1.5	1.7
Villages:	100.0	56.7	21.6	16.2	3.4	1.2	0.3	0.2	0.2	0.1	0.1
Northeast	100.0	78.5	11.2	8.2	1.3	0.5	0.1	0.1	0.1	—	—
North	100.0	63.9	20.2	13.0	2.1	0.3	0.1	0.1	0.2	—	0.1
East	100.0	34.8	28.2	27.3	7.0	1.5	0.7	—	0.2	0.2	0.1
Central	100.0	27.4	33.0	27.8	6.9	3.0	0.6	0.2	0.5	0.3	0.3
South	100.0	35.5	33.7	22.8	4.3	1.9	0.7	0.4	0.2	0.3	0.2

Source: Thailand, National Statistical Office, Report of the Household Expenditure Survey 1962-1963: Whole Kingdom, (Bankgkok, 1966), p. 61.

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Table 2.2--Distribution of Monthly Income by Annual Income Classes from Household Expenditure Survey, 1962-1963 (Amounts in Baht)

Income Classes (Baht)	North East	North	East	Center	South	Bangkok-Thornburi
	Urban Areas					
Under 3,000	357	273	305	368	466	} 428
3,000 - 5,999	491	428	585	490	653	
6,000 - 11,999	794	802	792	769	766	756
12,000 - 17,999	1,341	1,339	1,359	1,375	1,222	} 2,470
18,000 and over	2,935	3,211	2,413	3,000	2,882	
Average	1,089	834	1,055	1,090	1,206	1,519
	Rural Areas					
Under 3,000	151	252	318	311	334	--
3,000 - 5,999	377	437	469	494	487	--
6,000 - 11,999	704	639	850	916	858	--
12,000 - 17,999	1,358	1,344	1,236	1,698	1,474	--
18,000 and over	1,653	2,294	1,794	2,261	2,093	--
Average	249	378	612	718	619	--

Source: Adapted from Thailand, National Statistical Office, Reports of the Household Expenditure Survey, 1962-1963, 7 volumes.

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most monthly average family incomes, particularly those in the two lower brackets, when converted into an annual figure, "jumped" the class limits into odd arrays of figures from which no general conclusion could be drawn. Furthermore, whereas the average monthly incomes of families were available directly from the survey, the average annual incomes were not. As a result, one is faced with the dilemma of accepting the monthly income figures, some of which would jump the class limits, or accepting the distribution of families by income classes where the annual income class means were not available.

Finally, although the survey obtained information on income in kind (or nonmoney income), the information was incompletely presented. Only the average monthly income in kind for each region as a whole was shown, not the average monthly income in kind broken down by income classes. This average nonmoney income figure thus proved of very little use for this study except perhaps as a check against a similar figure derived from other sources.

In view of these deficiencies, a new approach for dealing with the existing data was necessary. After careful consideration, this study decided not to use the mean monthly income published in the survey reports (Table 2.2), but to accept the distribution of families by annual income class (Table 2.1). Having so decided, the next task was to find ways of obtaining average annual incomes that were consistent with the class limits.[12] The estimating technique chosen is

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described below:

1. For all classes in Table 2.1 except the top and the bottom classes, the class midpoints were used as the average annual income.

2. As the midpoints would be the same in each class for all regions, the analysis of income distribution by region would lose its meaning. In this case, only the national distribution would be relevant.[13] Still the town-village or urban-rural data presentation would be retained because in most cases it was possible to have national figures only through summation of all the regional or locational estimates.

3. For the two open-ended classes, that is, the lowest income class (under Baht 3,000) and the highest income class (Baht 18,000 and over), three alternative methods could be used to find their midpoints, namely, the arbitrary method, the method based on information from other reliable income distribution data, and the method based on some mathematical functions, particularly the Pareto distribution function. These alternatives are discussed below:

(a) The Arbitrary Method. In using this method, a researcher simply arbitrarily assigns the midpoint values to the top and the bottom open-ended brackets. Usually no reasons are given for why these values are selected; they normally come from the subjective or intuitive judgment of the individual researcher.

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(b) The Related Distribution Method. This method uses information from the income distribution in other years to compute the mean incomes to the open-ended brackets of the year in question. In the case of Thailand, the income distribution data for 1969 could be adapted for 1963 assuming that the pattern of average income in the two open-ended brackets in relation to their adjacent brackets is the same in 1969 and 1963. The proportion of the 1969 average income of the bottom (top) bracket, which is known, to that of the next higher (next lower) bracket could be used to compute the corresponding mean incomes for 1963. For example, if the average income of the top income bracket in 1969 was four times that of its next lower bracket, then this proportion would be used to multiply the known midpoint of the second top bracket in 1963 to obtain the estimated midpoint of the top bracket for that year.[14] This is certainly an improvement over the first method, because it is not unreasonable to assume that the average income of one bracket relative to that of the next bracket would be the same from year to year. Or, if there should be any changes, it is unlikely that they would be so great as to render this assumption totally unrealistic.

(c) The Mathematical Function Method. This method is usually based on the Pareto function, which stipulates that the percentage of people with income higher than any given income level will fall at a constant rate as the income level increases.[15] In mathematical form, the function is given as:

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where N_y is the number of persons or families with income higher than the level y; Y_0 is the minimum income received by persons or families; A is the location or monetary unit parameter; and b is the Pareto coefficient or the parameter which represents the percentage change in the number of income receivers to the percentage change in the income level.

If personal income is believed to be distributed according to this Pareto function, various information on income distribution could be derived from manipulating the function. If the 1963 mean income of the bottom bracket were to be estimated using the Pareto function, the procedure would require, first, the estimation of the minimum income, Y_0, and, second, use of the midpoint between this income and the floor of the second bottom bracket as the mean income for the bottom bracket. For the mean income of the top bracket, the function would be used to estimate the <u>total</u> income attributable to this bracket. By dividing this total income by the total number of persons or families in the bracket, the mean income of the bracket would result.[16]

Although this method of estimating the mean incomes of the open-ended brackets is elegant and impartial, it has several drawbacks. First, that the Pareto coefficient is always a constant, was empirically refuted.[17] Instead, the coefficient was often found to vary across an income range. Therefore, to use a constant relationship between income

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recipients and the level of income to find the mean incomes of the open-ended brackets is quite unwarranted. Second, although the Pareto function fits the upper tail of the actual income distribution quite well, it does so poorly for the lower tail. As a result, the minimum income derived from the Pareto function would almost always overestimate the true distribution. Third, the Pareto function is also known to have overestimated the mean income of the top bracket.[18]

Given these reservations concerning the Pareto method, and since the arbitrary method was inappropriate because the 1963 data should be on a comparable basis with the 1969 data (for the purpose of this study at least), the related distribution method was chosen for use here. This meant that the distribution patterns of the 1969 data was employed to find the mean incomes for the two open-ended classes. When all the midpoints of the 1963 income classes were multiplied by the number of families of the respective income classes (see Appendix A), the results obtained were the total family money income classified by size of income. This money income is similar in concept to the personal income used in the national income accounts.

From Table 2.3 it can be seen that the inequality of the distribution of income is quite striking. The families in the lowest income bracket constituting almost half of the total families receive less than 13 percent of the total family money income, whereas the families in the top income

Table 2.3--

Income Cla (Baht)	
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Table 2.3--Distribution of Total Families and Total Family Money Income, by Income Classes, 1963

Income Classes (Baht)	Mean Income (Midpoint) (Baht)	Total Families		Total Income	
		(Thousand)	Percent	(Baht Million)	Percent
Under 3,000	1,800[a]	2,489.0	48.1[c]	4,480.1	13.0
3,000 - 5,999	4,500	1,074.0	20.8	4,832.9	14.0
6,000 - 11,999	9,000	1,010.9	19.5	9,098.4	26.4
12,000 - 17,999	15,000	300.8	5.8	4,511.7	13.1
18,000 - 23,999	21,000	126.0	2.4	2,646.0	7.7
24,000 - 29,999	27,000	50.6	1.0	1,366.3	4.0
30,000 - 35,999	33,000	37.5	0.7	1,238.6	3.6
36,000 - 47,999	42,000	33.6	0.6	1,412.1	4.1
48,000 - 59,999	54,000	18.3	0.4	987.1	2.9
60,000 and over	117,500[a]	33.4	0.6	3,918.0	11.4
All Classes	6,666[b]	5,174.1	100.0	34,491.2	100.00

Source: Computed from Thailand, National Statistical Office, Reports of the Household Expenditure Survey, 1962-1963, (Bangkok, 1966), 7 volumes.

[a]For the calculation of midpoints of the two open-ended brackets, see text.

[b]This figure is the average annual family income for the whole country.

[c]Slightly different from the original percentage of 48.4 due to rounding errors in computation.

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bracket comprising less than two-thirds of one percent of all families receive almost 12 percent of the total family income. A more exact measure of income inequality will be discussed later in this chapter.

Income Distribution in 1969

Nature of Data and Method of Study

Similar to the situation in 1963, the main source of data for estimating income distribution in 1969 also came from a household sample survey, the socio-economic survey of 1968-1969.[19] The objective of this and the 1962-1963 survey was substantially the same, that is, to study the composition of households and their spending patterns. The 1968-1969 survey, however, emphasized an important aspect which was lacking in previous surveys: explicitly to obtain information on household income, sources of income, and distribution of income both in municipal areas and villages.[20] As a result, the 1968-1969 survey provides much more complete, consistent, and reliable information on the distribution of income in Thailand than any other source. Although there are many defects in the data, the quality is much improved over the 1962-1963 material.

The survey procedure was detailed in a single volume, Report of the Socio-Economic Survey, 1968/69, published by the National Statistical Office in 1974. Sample households were again selected by a three-stage stratified sampling

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technique, which was somewhat different from that used in 1962-1963. In the first stage, in addition to Bangkok and Thonburi which were selected as self-representative, two changwads or provinces were selected from each of the nine subregions of the country. Sample city blocks and sample villages then were selected at random from each changwad. The third stage classified households in each sample block or sample village into different occupational groups, and from each group at least two households were selected at random to form the final sample households. Interviews with the 1,500 units selected were carried out in three rounds between January and September 1969, with partial household replacements in the second and third rounds. In all, approximately 4,500 households were canvassed in each round. At the end of the survey period, some 13,500 questionnaires were obtained from 6,000 sample households (the original number plus replacements).

The unit of study in this survey was the household, defined as a person or a group of related or unrelated persons who live, eat, and share other living essentials together, although some persons may keep their finances separately. Strictly speaking, this is not the same unit study in the 1962-1963 survey, which used the economic family. But because the majority of households in Thailand are one-family households, the difference is unimportant; the household in the 1969 survey can be considered identical to the economic

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The 1968-1969 survey's income concept is the same as that used in earlier projects. It includes wages, salaries, overtime payments, bonuses, net profits from self-employment, shares of profit and interest, pensions and annuities, money received for rents, and income from other sources.

One other difference between the two surveys deserves attention here: the composition of urban and rural areas. In the earlier survey, both municipalities and sanitary districts were both classified as urban areas (or towns), whereas the villages outside municipal or sanitary districts were regarded as rural areas. In the 1968-1969 survey, only the municipalities were designated as urban areas, and both sanitary districts and villages were combined as rural areas. The main reason for this reclassification, according to an NSO official, was that the sanitary districts in 1969 exhibited characteristics more closely resembling villages than municipalities, hence the change. This could also mean that the municipalities had become much more "urbanized" in the intervening six years, much more so than the sanitary districts. The discrepancy, however, should not have any effect on the analysis in this study, especially since the main emphasis is at the national, not the locational or regional level.

The general methodology for estimating the national distribution of income in 1969 was similar to that used in 1963. The income distribution pattern determined by the survey was considered representative of all households in the

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country, and the figure was "blown up" by the distribution of households by corresponding income classes.[22] Fewer problems are encountered in the 1969 than in the 1963 data. The presentation of household distribution of income in the 1969 survey report is consistent: the annual income classes are used, and the average annual income for each income class is given. Moreover, the actual average incomes for both open-ended income classes--the top and the bottom income brackets--are also available, thus eliminating risky attempts to interpolate such mean incomes.

The Income Distribution Estimates

Most information needed for estimating income distribution appears in the ten published tables in the 1968-1969 survey report. The data are presented in a rather odd way, however, Although the income distribution is given for both urban and rural areas in all of the four geographical regions (the previously separated center and east are combined into one region), the national income distribution is omitted. Although one could combine the total families and incomes of urban and rural areas to arrive at this figure, this process is not easy because the income class intervals for urban and rural households are different. Within each urban area, the income level is divided into 12 brackets, ranging from under Baht 3,000 per year to over Baht 60,000 per year. Within each rural area, the income level begins with the same lower

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bracket, but then progresses by smaller intervals until the top, open-ended eleventh bracket of Baht 33,000 and over is reached. To obtain a national income distribution, the urban income brackets must be compressed to coincide with the rural income brackets. As a result, only seven brackets are obtained in the national income distribution. There is no systematic way short of retabulation of the entire survey data to expand the income brackets of the rural households to fit the wider urban income brackets. This is a serious fault which should be corrected in the next survey.

The distribution of households and income for urban areas, rural areas, and the entire country for 1969 are presented in Tables 2.4, 2.5, and 2.6 respectively.

Before discussing these tables, it should be pointed out that in estimating these income distribution series, the average annual income by income classes used is not that published in the NSO report. Rather, the figures were supplied by Dr. Oey Meesook of Thammasat University. (See Appendix B for details.) Sensing that there might be some inconsistencies in the final tabulation of results, Dr. Meesook obtained the original survey tapes and ran them through the computer to check the reliability of the official results. She found that, indeed, some adjustments were made in the final tabulations, especially in the two open-ended brackets.[23] The average income of the bottom bracket in the NSO series was generally larger than Meesook's recomputed figure, and

Table 2

Income (Ba	
Under 3	
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18,000	
24,000	
30,000	
36,000	
48,000	
60,000 a	
All Cl	

Sources:

Table 2.4--Distribution of Money Income of Urban Households, by Income Classes, 1969

Income Classes (Baht)	Average Annual Income (Baht)	Total Families (Thousand)	Total Income (Baht Million)
Under 3,000	1,731	6.9	12.0
3,000 - 5,999	4,421	29.6	131.1
6,000 - 8,999	7,373	55.9	412.3
9,000 - 11,999	10,281	84.0	863.9
12,000 - 14,999	13,171	85.9	1,131.3
15,000 - 17,999	16,167	74.7	1,207.2
18,000 - 23,999	20,232	139.6	2,824.0
24,000 - 29,999	26,062	83.8	2,184.2
30,000 - 35,999	32,233	51.1	1,647.4
36,000 - 47,999	40,575	54.9	2,225.5
48,000 - 59,999	52,752	34.0	1,791.6
60,000 and over	116,742	61.7	7,201.5
All Classes	28,385[a]	762.1	21,632.0

Sources: Computed from retabulated results of the 1968-1969 Socio-Economic survey supplied by Dr. Oey Astra Meesook of Thammasat University, and from Thailand, National Statistical Office, Report of the Population and Housing Census, 1970, (Bangkok , 1974).

[a]This figure is the average annual money income for the whole urban households.

Table 2

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Sources:

Table 2.5--Distribution of Money Income of Rural Households, by Income Classes, 1969

Income Classes (Baht)	Average Annual Income (Baht)	Total Families (Thousand)	Total Income (Baht Million)
Under 3,000	1,701	1,416.6	2,409.1
3,000 - 4,499	3,629	797.7	2,894.9
4,500 - 5,999	5,128	579.0	2,969.4
6,000 - 7,499	6,591	505.8	3,334.0
7,500 - 8,999	8,141	384.9	3,133.4
9,000 - 10,499	9,624	325.7	3,134.4
10,500 - 11,999	11,130	177.0	1,969.7
12,000 - 14,999	13,113	312.8	4,101.8
15,000 - 17,999	16,009	197.9	3,168.7
18,000 - 32,999	23,002	334.7	7,699.4
33,000 and over	70,255	114.2	8,205.1
All Classes	8,359[a]	5,146.4	43,020.0

Sources: Computed from retabulated results of the 1968-1969 Socio-Economic survey supplied by Dr. Oey Astra Meesook of Thammasat University, and from Thailand, National Statistical Office, Report of the Population and Housing Census, 1970, (Bangkok, 1974).

[a]This figure is the average annual money income for the whole rural households.

Table 2.

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Table 2.6--Distribution of Money Income of National Households, by Income Classes, 1969

Income Classes (Baht)	Average Annual Income (Baht)	Total Families		Total Income	
		(Thousand)	Percent	(Baht Million)	Percent
Under 3,000	1,701	1,423.5	24.1	2,421.0	3.7
3,000 - 5,999	4,263	1,406.4	23.8	5,995.4	9.3
6,000 - 8,999	7,268	946.6	16.0	6,879.8	10.6
9,000 - 11,999	10,172	586.7	9.9	5,968.0	9.2
12,000 - 14,999	13,125	398.7	6.8	5,233.1	8.1
15,000 - 17,999	16,052	272.6	4.6	4,375.9	6.8
18,000 and over	38,650	874.0	14.8	33,778.7	52.3
All Classes	10,942[a]	5,908.5	100.0	64,652.0	100.0

Sources: Computed from retabulated results of the 1968-1969 Socio-Economic survey supplied by Dr. Oey Astra Meesook of Thammasat University, and from Thailand, National Statistical Office, Report of the Population and Housing Census, 1970, (Bangkok, 1974).

[a]This figure is the average annual money income for the whole national households.

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The distributions of income in both urban and rural areas, as shown in Tables 2.4 and 2.5, are quite skewed. The mean income is Baht 28,385 for urban households and Baht 8,359 for rural households, but the median income is estimated at only Baht 19,890 and Baht 5,696 for these households, respectively. This skewness also is reflected in the national figure, where the mean income is Baht 10,942 and the median income is estimated at Baht 6,395. In the national distribution of income series shown in Table 2.6, over one-half of the total families, bunching into the first two lower brackets, received only less than 4 percent of the total money income, whereas less than 15 percent of the total families comprising the top income bracket receive over one-half of the total money income. Again, a more concise measure of this apparent income inequality will be dealt with shortly.

Comparison between the 1963 and 1969 Distributions of Income

In comparing the distribution of income between the two years, one must always keep in mind the definitional and procedural differences between the two estimates pointed out earlier, particularly the difference in the classification of urban and rural households. At the national level, however,

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there are few difficulties in comparing the two estimates. In the following section, the two estimates of income distribution by income class will be compared, and the statistical measurement of income inequality will be discussed.

Income Distribution by Income Classes 1963 and 1969

Table 2.7, which compares the estimates of income distribution in 1963 and 1969, is taken partially from Tables 2.3 and 2.6. In 1963, an estimated 48.1 percent of all families had an annual money income of less than Baht 3,000 per family. This figure dropped to 24.1 percent in 1969. The fact that many families moved up the income scale by 1969 also is reflected in the percentage of families in the top income bracket: the figure increased from 5.6 percent in 1963 to 14.8 percent in 1969. However, one must be aware that this was in part attributable to about 15 percent increase in the price level from 1963 to 1969. In both years, families in the top bracket, as a group, received the largest share of total money income compared to any group below it, regardless of size.

To facilitate comparison of two or more distribution patterns, researchers often resort to the graphical technique of the Lorenz curve, introduced by M. O. Lorenz in 1905.[24] In this case, this method requires that the cumulative distribution of families be plotted along the bottom horizontal axis of a unit square as well as the cumulative percentage distribution of income along the vertical axis on the left. A curve connecting all the points which correspond to

Table 2.7--A Comparison Between Distribution of National Money Income in 1963 and 1969, by Income Classes (Families in Thousands, Income in Millions of Dollars)

Table 2.7--A Comparison Between Distribution of National Money Income in 1963 and 1969, by Income Classes (Families in Thousands, Income in Millions of Baht)

Income Classes (Baht)	Amount				Percentages			
	1963		1969		1963		1969	
	Families	Income	Families	Income	Families	Income	Families	Income
Under 3,000	2,489.0	4,480.1	1,423.5	2,421.0	48.1	13.0	24.1	3.7
3,000 - 5,999	1,074.0	4,832.9	1,406.4	5,995.4	20.8	14.0	23.8	9.3
6,000 - 8,999	} 1,010.9	} 9,098.4	946.6	6,879.8	} 19.5	} 26.4	16.0	10.6
9,000 - 11,999			586.7	5,968.0			9.9	9.2
12,000 - 14,999	} 300.8	} 4,511.7	398.7	5,233.1	} 5.8	} 13.1	6.8	8.1
15,000 - 17,999			272.6	4,375.9			4.6	6.8
18,000 and over	299.4	11,568.1	874.0	33,778.7	5.8	33.5	14.8	52.3
All Classes	5,174.1	34,491.2	5,908.5	64,652.0	100.0	100.0	100.0	100.0

Source: Adopted from Tables 2.3 and 2.6.

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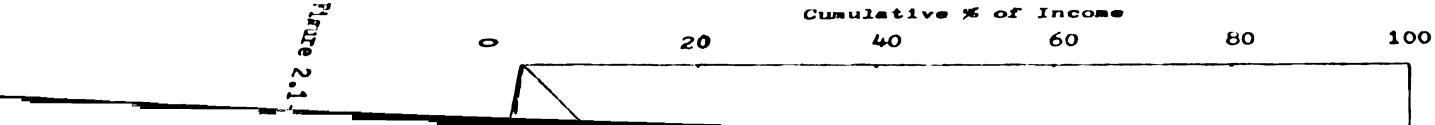
the coordinates of these two cumulative frequencies is called the Lorenz curve. This curve represents the income distribution of a given group of families.[25] Using this technique, both 1963 and 1969 income distribution series are shown by the two Lorenz curves in Figure 2.1.

In Figure 2.1, the straight diagonal line is called the line of perfect equality, or egalitarian line, since any point along this line would correspond to the same percentage of families having the same percentage of income. A Lorenz curve that traced a distribution pattern away from this line would mean that the distribution is more unequal the greater the distance. With two or more Lorenz curves, the one lying closer to the line of perfect equality and not crossing any other Lorenz curves would depict a more equal distributional pattern than the curve lying farther away. The similarity between the Lorenz curves of 1963 and 1969 in Figure 2.1 is quite extraordinary; they are virtually identical. Perhaps the 1969 income distribution could be seen to be very slightly more equal since its Lorenz curve lies closer to the egalitarian line than the 1963 Lorenz curve around the fourth quintile of the household distribution. Visually, these two curves still lie quite far away from the line of perfect equality, indicating that the money income distributions in both years are still quite unequal. A more precise measure of income inequality is considered in the next section.


Cumulative % of Income
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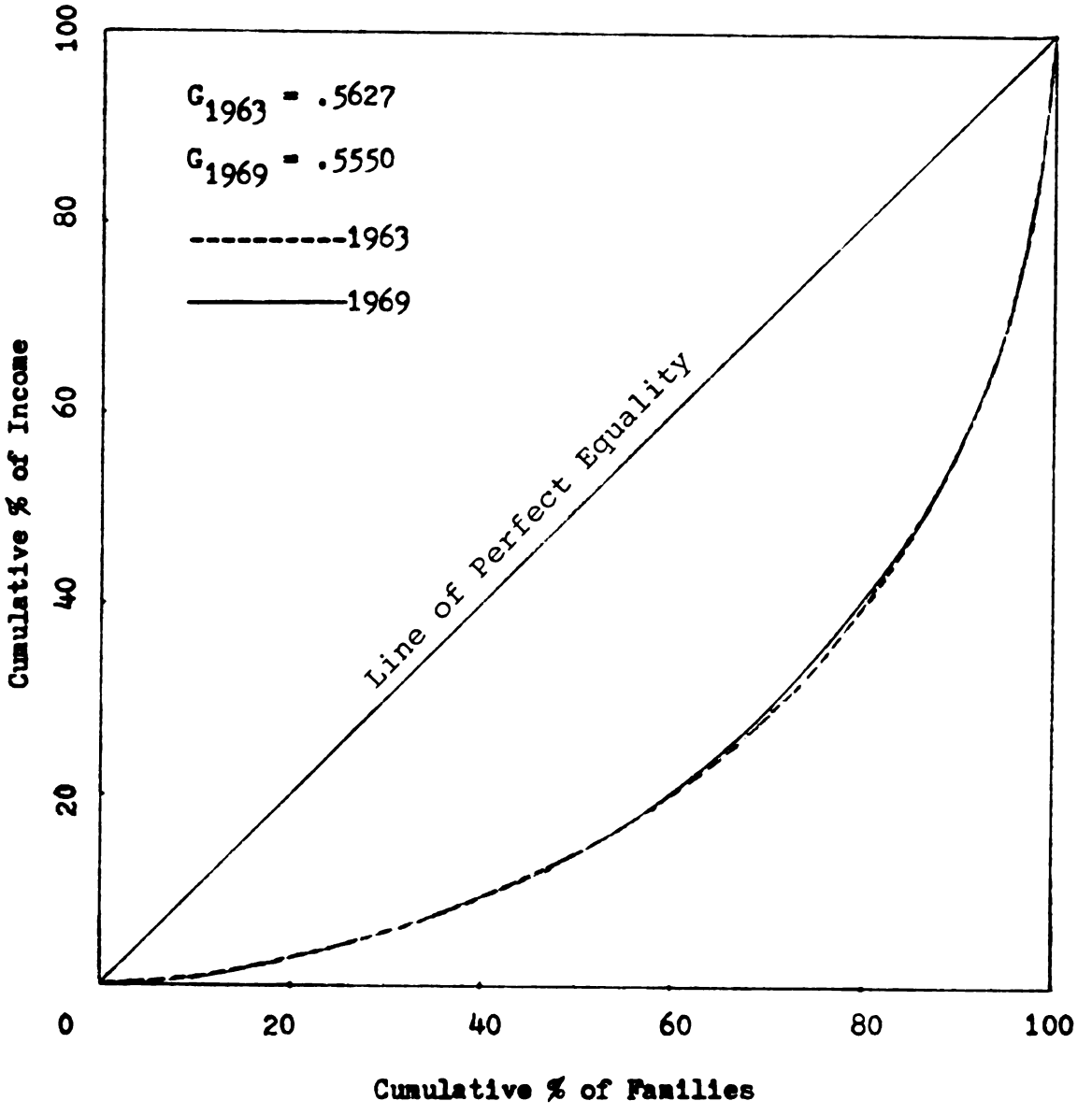

Figure 2.1--Distribution of Money Income in Thailand: 1963 and 1969

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Statistical Measures of Income Inequality

While the Lorenz curve is a useful device for describing the pattern of income distribution and depicting the extent of its inequality according to the proximity of the curve to the egalitarian line, it is not a convenient practical measure of income inequality because of its graphical nature. Furthermore, in comparing two Lorenz curves, if one curve is not completely inside the other curve, but crosses it at some points, visual examination alone is inadequate or even impossible in determining which distribution is the more equal. Therefore, some measures or indices of income inequality are necessary.

There are more than a dozen income inequality measures from which to choose. Among these are the Pareto coefficient, the Gini concentration ratio, the coefficient of variation, the standard deviation of the logarithms of income, the relative mean difference, the Elteto-Frigyes index, Atkinson's measure, Oshima's index of decile inequality, Theil's index, and so on.[26] One of the most widely used measures, however, is the Gini concentration ratio or Gini coefficient, first developed by C. Gini in 1905.[27] This ratio is superior to many other measures, but not necessarily the best, for as D. G. Champernowne has argued, there is no single "best" index or coefficient for every aspect of income inequality.[28] The Gini concentration ratio has been widely adopted because it is easy to estimate from existing income distribution data, and the meaning of the coefficient itself is easy to

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understand. Moreover, it is directly associated with the concept of the Lorenz curve, which is widely used, making it an even more attractive measure.

Using the Lorenz diagram as a reference, the Gini concentration ratio measures the proportion of the area bounded by the egalitarian line and the Lorenz curve to the total area under the egalitarian line. The ratio ranges in value from zero (perfect equality) to one (perfect inequality). In the former case, the Lorenz curve will coincide with the egalitarian line so that there is no bounded area. In the latter case, the Lorenz curve will trace the lower horizontal axis and the right vertical axis of the unit square, making the bounded area and the total area identical, so the ratio is one. Numerically, the Gini concentration ratio can be calculated from the following formula:

$$G = 1-2\left[\sum_{1}^{n}(f_i - f_{i-1})(y_{i-1}) + \tfrac{1}{2}(f_i - f_{i-1})(y_i - y_{i-1})\right],$$

where G is the Gini concentration ratio; f_i and y_i are the ith observations of the cumulative fraction of the recipients or families and the cumulative fraction of income, respectively; and i = 1,2,.....,n, where the nth observation is the final point in the Lorenz curve. This formula seems a cumbersome expression of a very simple idea, but the computation is straightforward and simple, although tedious.

However, the above formula shows only an approximation of the area between the Lorenz curve and the egalitarian line, which tends to understate the actual inequality; when a straight

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line is drawn between two observation points on the Lorenz curve, this line will lie above the actual Lorenz curve. So, the sum of all trapezoidal areas from point (0,0) to point (1.1) of the Lorenz box will be greater than the integral of the Lorenz curve between the same interval. Subsequently, the Gini ratio of concentration derived from this trapezoidal approximation (TA) method will be smaller than that derived from the integration method.

If possible, the TA method should be replaced by the integration method, but to be able to integrate the entire area under the Lorenz curve, one must know the mathematical function of that curve. There are several ways in which the Lorenz curve function can be generated, but the method adopted in this study is the one devised by N. C. Kakwani and N. Podder of the World Bank.[29]

According to Kakwani and Podder, if F(x) is the proportion of units (families) that receive income up to x, and F_1 (x) is the proportion of total income received by the same units, the Lorenz curve is then the graphical representation of the relationship between F(x) and F_1 (x). This curve is shown again in Figure 2.2.

Supposing that P is any point on the curve with coordinates (F,F_1), the line from this point perpendicular to the egalitarian line, called η, would have the length $1/\sqrt{2}\ (F-F_1)$, and the segment of the egalitarian line from the origin to η, called ¶, would have the length $1/\sqrt{2}\ (F+F_1)$. The equation of the Lorenz curve in terms of ¶ and η could now be written as:

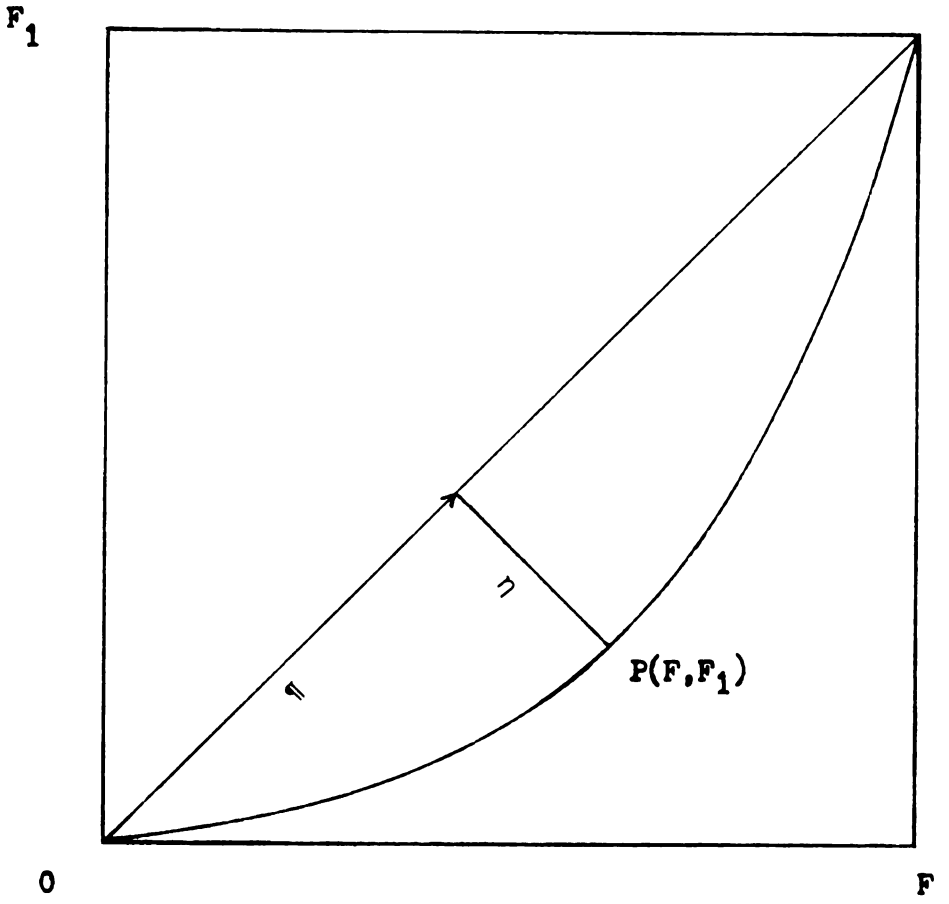

Figure 2.2--A Hypothetical Lorenz Curve

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where ¶ varies from zero to $\sqrt{2}$. Specifically, the equation of the curve proposed by Kakwani and Podder is of the form

$$\eta = a\P^{\alpha} (\sqrt{2} - \P)^{\beta}, \; a > o, \; \alpha > o, \text{ and } \beta > o, \tag{2}$$

where a, α, and β are the parameters to be estimated.

From grouped observations of a given income distribution, it is possible to obtain r_t and y_t as the consistent estimators of $\P_t$ and η_t, respectively, where

$$r_t = \frac{p_t + q_t}{\sqrt{2}}$$

and

$$y_t = \frac{p_t - q_t}{\sqrt{2}},$$

where p_t and q_t are the observed cumulative proportions of income receiving units and the observed cumulative proportion of the total income of those units, respectively. The parameters of the chosen Lorenz curve function (2) can then be estimated from the following log-transformed linear regression equation:

$$\log y_t = a' + \alpha \log r_t + \beta \log (\sqrt{2} - r_t) + w_{1t}, \tag{3}$$

where $a' = \log a$, and w_{1t} = random disturbance.

When the parameters are known and the Lorenz curve determined, the Gini concentration ratio can be estimated from the following integral:

$$G = 2 \int_{o}^{\sqrt{2}} f(\P) \, d\P,$$

which for the Lorenz curve of Equation (2) is

$$G = 2 \int_0^{\sqrt{2}} a\P^{\alpha} \left(\sqrt{2} - \P \right)^{\beta} \, d\P$$

$$= 2a(\sqrt{2})^{1+\alpha+\beta} B(1+\alpha, 1+\beta),$$

where $B(1+\alpha, 1+\beta)$ is the Beta function, whose value could be obtained from the Beta function table or could be recomputed.

Of course, the parameter ¶ is to be replaced in actual computation by p. As expected, the Gini concentration ratio obtained from the Kakwani-Podder (KP) method shows a greater degree of income inequality than the estimate from the TA method.

Some may question the advantage of using the complicated KP method over the simple TA method in computing the Gini concentration ratios, especially when the income distribution observations are as few as five to seven, as in the case of Thailand in 1963 and 1969. It might appear that the new estimate is not worth the effort. Since the estimated Lorenz curves for both years have an extremely high goodness of fit and very low standard errors despite few observations, and since the estimation procedure is greatly facilitated by high-speed computers, there is good reason to select the KP method in computing the Gini concentration ratios. What is more important is that the KP method makes the comparison of the Gini concentration ratios between 1963 and 1969 much more compatible and more reliable because the problem of having to approximate and then compare the ratios from two different observations with different frequency distributions of households in the same income class is eliminated.[30]

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At the end of the previous section it was mentioned that perhaps the 1969 money income distribution might be somewhat more equal than the same distribution in 1963 simply from looking at the free-hand drawing of the Lorenz curves in Figure 2.1. This belief is confirmed when the Gini concentration ratios have been estimated at .5627 and .5550 for 1963 and 1969, respectively. Also, the Gini coefficients of these magnitudes are regarded as depicting a very high degree of income inequality in the country.[31]

Adjustments in the Income Concept

An important question arises: How complete and reliable is the estimate of money income distribution presented above? An honest answer would be that it is not as complete and reliable as one would wish. Certainly, it could not be compared to the well-known income concept used by Joseph Pechman and Benjamin Okner in their tax incidence study in the United States,[32] and there is room for improvement.

It is appropriate that the income concept of Pechman and Okner should serve as a model which this study strives to emulate. After careful investigation, it was found that various adjustments could be made to the Thai money income estimate to arrive at the equivalent of "adjusted family income" which Pechman and Okner used as the final income base in their tax incidence estimation. In this study, a similar income concept will be referred to simply as "adjusted income" in contrast to the previously obtained "money income."

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This adjusted income will be composed of (1) personal income, (2) nonmoney income or income in kind, (3) net corporate retained earnings, and (4) indirect taxes.[33] When completed, this income concept will be as close to the Simons-Haig definition of income as one possibly could be under the present statistical conditions. In the following sections, the adjustment procedures will be discussed in some detail.

Personal Income

It was pointed out earlier that the money income estimates from the 1962-1963 and 1968-1969 surveys had the characteristics of personal income as defined in terms of national income accounting. But if the personal income estimates from the national income accounts of Thailand were to be taken as reliable references, the money income estimate in this study would, to a great extent, understate the true personal income of households. In 1963 and 1969, personal income estimates from the national income accounts were Baht 56,966.5 million and Baht 102,615.0 million, respectively.[34] The money income in the same period was estimated in this study at Baht 34,491.2 million and Baht 64,652.0 million leaving the underreported personal income of Baht 22,475.3 million in 1963 and Baht 37,963.0 million in 1969. This is quite understandable and in fact to be expected because income information obtained from surveys is often incomplete due to the forgetfulness or the attempt to cover up actual income on the part of the individuals being interviewed. The

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next important question is how to deal with this underreported income.

First, it was arbitrarily decided that 10 percent of this income be allocated to the top income bracket alone and 90 percent to all income brackets according to the pattern of the distribution of money income in each year. One might ask whether the extra 10 percent allotted to the highest income group would over-estimate the actual income position of that group. Most likely the answer would be negative. If anything, this figure is even insufficient to cover the real income position of the top income group since individuals in this group are likely to receive their income from various sources, some of which might not be accounted for at all. At any rate, this percentage was chosen because it would give a reasonable bias toward a more logical distribution of income. The distribution of this underreported personal income in absolute terms is presented in column 2 of Tables 2.8 and 2.9.

The already determined money income plus underreported income should be equal to the personal income estimate of the national income account. However, further adjustments are needed owing to the apparent underestimation of the imputed rents of the owner-occupied homeowners given in the official statistics.

In the national income accounts,both actual and imputed rents of households were presented under the industrial category of "Ownership of Dwelling" in the gross national

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product table. However, the recent 1970 population and housing census casts serious doubt on these estimates.[35] In that census, renters were asked about the actual rents they paid each month, and the frequency distribution of the renters by rent class was recorded. The average rent paid by a renter amounted to about Baht 263 a month for an urban dwelling, and Baht 175 a month for a rural dwelling.[36] While the urban average rent was credible and indeed quite acceptable, the rural average rent was not; it was too high. Most rural householders are farmers who own their own homes. Those who were reported as rural renters in the census are likely to rent houses in the sanitary districts or village centers, where dwellings are more similar to urban rented houses than rural owner-occupied homes. If one assumes that the actual rent is equivalent in value to the imputed rent regarding the same type of house, then the urban rent figure from the census certainly can be used, but not the rural rent figure.

With the above assumption, the total imputed rents for urban households would be Baht 1,470.2 million per year, compared with the official figure of only Baht 934.9 million. Total rents, actual and imputed, for urban households alone would be Baht 2,405.1 million, or 93 percent of the total value added for ownership of dwellings for the whole country given by the national accounts in 1969. In short, one is faced with a choice of accepting the estimates of the national accounts, which is likely to understate the actual rental income, or accepting the rent figure computed from average urban rent

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from the 1970 population and housing census. The latter choice obviously is preferred.

In so doing, the average rural rent is then assumed to be one-fourth the amount of the urban rent, or about Baht 65 per month or Baht 730 per year. With the total owner-occupied rural houses numbering 4,970,356, the estimated imputed rents for rural households for 1969 would amount to Baht 3,876.9 million. Together with the total urban imputed rents, the figure for the whole country becomes Baht 5,347.1 million. Subtracting the official total rent of Baht 2,570.0 million, the amount of understated rent would be Baht 2,769.1 million.

The next question is how to allocate these imputed rents to various income brackets. There appears no better allocation rule than to assume that such rents are distributed according to the distribution of income patterns in urban and rural areas, the reason being that the income positions of the owners, to a great extent, determines the quality (and value) of the houses they own.

Lack of data in 1963 forced an assumption that the rent pattern was the same in 1963 as in 1969, but the level of average rents was deflated 15 percent, to about Baht 224 per month for an urban house and Baht 55 per month for a rural house. The proportions of rented to owned houses in both urban and rural areas also was assumed to be the same, that is, about 67 percent of urban families owned their own homes, while about 97 percent of rural families were owners. The number of owner-occupied houses in 1963 was estimated at

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546,945 and 4,036,170 in the urban and rural areas, respectively. Multiplying these figures by the average imputed rents, the total imputed rents become Baht 1,824.6 million for urban households and Baht 2,663.9 million for rural households. The underreported rent, which was estimated at Baht 2,700.4 million, was then distributed to households in the same way as was done in 1969. The result of the distribution is shown in column 3 in Tables 2.8 and 2.9.

Income in Kind

The importance of income in kind in an income base cannot be overemphasized. In underdeveloped countries, where the majority of households are in the farming sector, a major part of their income is often in the form of food grown or produced for their own consumption. By including this "income in kind" in the income concept, the income positions of the lower income brackets are considerably improved. But income in kind is not necessarily restricted to the lower income groups; the higher groups could also receive income in kind in the form of fringe benefits, living amenities, stock options, real estate appreciation, and so forth.

There is no published information available at present on income in kind distributed by income classes. Fortunately, the 1968-1969 socio-economic survey did include a question about the goods and services that were produced at home or were received free. Although the responses to this question were not reported in the published statistics, they could be obtained from the original data tapes. Again, Dr. Oey Astra

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Meesook was instrumental in extracting this important information from the raw data. The average income in kind or the estimated value of goods and services produced at home or received free by families by income classes is shown in Appendix C. Total income in kind is estimated by multiplying the number of households by the average income in kind. The result for 1969 is shown in column 4 of Table 2.8.

These 1969 data can be applied to the 1963 situation. A general methodology requires that (1) some relationship between money income and income in kind in 1969 be established, and (2), by assuming that the same money income/income in kind relationship also existed in 1963, some adjusting factors which reflect this relationship be applied to the money income in 1963 to arrive at the income in kind for that year. Specifically, the method used by Meesook was to regress the 1969 "total" income, defined as money income plus income in kind, on the 1969 money income using the least-square regression technique. The regression equation took the following form:

$$y_t = a + bY_m + u,$$

where Y_t and Y_m are the average total income and the average money income of households, respectively, a and b are estimating parameters, and u is the stochastic disturbance. The regression is carried out for each urban and rural area in each region, and the results obtained are series of statistical estimates of average total income in each area in each region as a function of the average money income in that area and region (See Appendix C).

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For each linear estimate the average money income for 1963 is then plugged in to give the estimated average total income for a particular area and region. Simply by subtracting the average money income from the estimated average total income, what remains is the estimated income in kind classified by size, location, and region for 1963. To obtain a national income-in-kind figure, some distributive weights are applied to the above results. The 1963 average income in kind by income class for the whole country is shown in column 4 of Table 2.9.

Net Corporate Retained Earnings

One of the reasons that net corporate retained earnings should be included as income is that they constitute real as well as potential consumption power of those who hold shares in corporations. This reasoning is also consistent with the Simons-Haig definition of income mentioned earlier in the chapter. This portion of income has become quite important. In Thailand, a growing number of people in the higher income classes have begun to invest their surplus money in business corporations, as is evidenced by a tremendous expansion of private and public companies and increased security market activities during the past decade. But the statistical information on the net savings of corporations in Thailand is still very imperfect, and the available record of net corporate savings is certainly too low. Nevertheless, until attempts to gauge the true extent of net corporate savings are successful, one must be content with the existing

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The source of data for corporate saving is found in the national income accounts.[37] In 1963 the net corporate profits after taxes and dividends were estimated at Baht 819.7 million, Baht 551.1 million of which were savings of government enterprises and Baht 264.6 million of which were savings of private corporations and cooperatives. The total amount of net retained earnings for 1969 was Baht 2,358.0 million, of which Baht 1,226.2 million were the savings of public corporations and Baht 1,131.8 million the savings of private corporations and cooperatives.

Ideally, the allocation base for this kind of income would be the distribution of investment income by income classes. This statistical series, however, is not available in Thailand. The following arbitrary allocation rules, therefore, were used:

1. Savings of government enterprises	1963	1969
Total amount (Baht million)	555.1	1226.2
(a) 25 percent allocated on a per family basis	138.8	306.5
(b) 75 percent allocated on a total expenditure basis	416.3	919.7
2. Savings of private corporations	1963	1969
Total amount (Baht million)	264.6	1131.8
(a) 80 percent allocated to the top income bracket	211.7	905.4
(b) 20 percent allocated by income distribution	52.9	226.4

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The reasoning behind the above allocations is quite simple. Savings in the hands of public corporations should, theoretically, be shared by all households. Thus, 25 percent of these were allocated on a per family basis. But public companies also operate like private firms, and their savings could be used to expand or improve the services which would benefit households according to their spending patterns. For private companies, it is assumed that the top income bracket holds most of the shares of stock; only a small proportion being held by lower income groups. Hence the allocation of the remaining 20 percent of private corporate savings by income distributional pattern.

The distribution of the net corporate retained earnings by income classes is shown in column 5 of Tables 2.8 and 2.9.

Indirect Taxes

The last adjustment in the income concept involves the inclusion of indirect taxes in the income thus far estimated. The amount of indirect taxes to be included are taken from the 1963 and 1969 national income accounts. These taxes amounted to Baht 6,461.1 million in 1963 and Baht 14,206.9 million in 1969. Thus far the matter is simple and uncomplicated. But the method used in allocating these taxes among income classes is more difficult. The distributive pattern of indirect tax burdens by size of classes of income must be obtained from Chapter 3 of this study which deals with tax

incidence. Then, based on this pattern, these taxes are allocated to different income classes. The distribution of indirect taxes by income classes is presented in column 6 of Tables 2.8 and 2.9.

The Adjusted Income Concept

Now that all necessary adjustments have been accomplished, the final step is to total all the income elements. The distribution of the adjusted income for the whole country by income classes in 1963 and 1969 is presented in Tables 2.8 and 2.9 The Lorenz curves for the two new distributions of income are shown in Figure 2.3.

It is clear from Tables 2.8 and 2.9 and Figure 2.3 that the relative income positions of households in lower-income brackets has improved considerably compared to the distribution of money income as shown in Table 2.7. For example, the income share of the lowest income bracket rose from 13.0 percent to 19.7 percent in 1963, and from 3.7 percent to 6.0 percent in 1969. Similarly the share of the top income group in the adjusted income distribution fell from 33.5 percent to 30.4 percent in 1963, and from 52.3 percent to 48.5 percent in 1969. In terms of the degree of income inequality, the Gini concentration ratios for the distributions of adjusted income are estimated at .4559 and .4822 for 1963 and 1969, respectively, an overall improvement in income equality from the distribution of money income. This improvement is, of course, to be expected. Income in kind alone played a

Table 2.8--Distribution of Adjusted Income, by Income Elements, by Income Classes, 1969
(Amounts in Millions of Baht)

Income Classes (Baht)	Personal Income			Income In Kind	Net Corporate Retained Earnings	Indirect Taxes	Adjusted Income	
	Money Income	Adjustments in Underreported Income	Adjustments in Imputed Rents				Amount	Percent
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 3,000	2,421.0	1,277.8	112.8	4,012.8	142.4	820.5	8,787.3	6.0
3,000 - 5,999	5,995.4	3,167.3	278.4	6,118.5	202.3	1,584.9	17,346.8	11.9
6,000 - 8,999	6,879.8	3,635.3	316.3	4,015.9	188.7	1,767.7	16,803.7	11.6
9,000 - 11,999	5,968.0	3,153.6	268.5	2,005.3	150.7	1,472.0	13,018.1	9.0
12,000 - 14,999	5,233.2	2,764.1	231.2	717.3	125.7	1,305.7	10,377.2	7.1
15,000 - 17,999	4,375.9	2,313.1	190.5	525.0	98.1	1,027.9	8,530.5	5.9
18,000 and over	33,778.7	21,651.8	1,371.5	6,101.8	1,450.2	6,228.3	70,582.3	48.5
All Classes	64,652.0	37,963.0	2,769.1	23,496.6	2,358.0	14,206.9	145,445.9	100.0

Source: See text.

Elements by Income Classes, 1963

Table 2.9--Distribution of Adjusted Income, by Income Elements, by Income Classes, 1963
(Amounts in Millions of Baht)

Income Classes (Baht)	Personal Income			Income In Kind	Net Corporate Retained Earnings	Indirect Taxes	Adjusted Income	
	Money Income	Adjustments in Underreported Income	Adjustments in Imputed Rents				Amount	Percent
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Under 3,000	4,480.1	2,627.6	371.1	6,317.4	177.8	1,472.5	15,446.5	19.8
3,000 - 5,999	4,832.9	2,833.9	394.2	2,069.1	104.6	1,060.1	11,294.8	14.5
6,000 - 11,999	9,098.4	5,336.1	723.9	1,808.8	145.3	1,616.0	18,728.5	24.0
12,000 - 17,999	4,511.7	2,645.8	348.7	492.9	69.2	795.1	8,863.4	11.3
18,000 and over	11,568.1	9,031.9	862.4	521.5	322.9	1,520.4	23,827.2	30.5
All Classes	34,491.2	22,475.3	2,700.4	11,209.7	819.7	6,464.1	78,160.4	100.0

Source: See text.

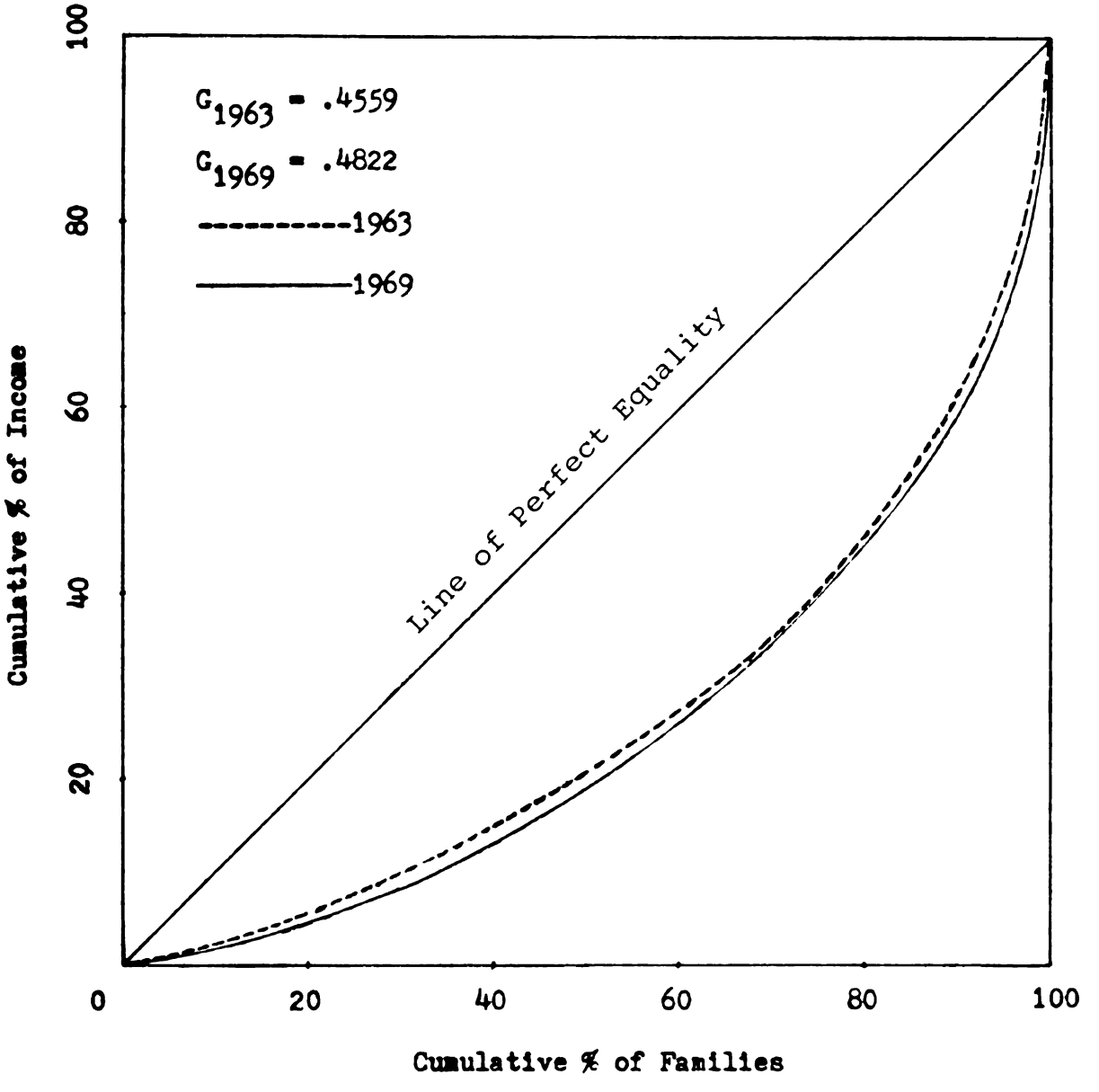

Figure 2.3--Distribution of Adjusted Income in Thailand: 1963 and 1969

very important part in raising the relative income positions of the lower income brackets. Various other income adjustments also helped smooth out greater disparities in the distribution of cash income.[38]

One striking fact which must be emphasized, however, is that despite the improvement in income equality in the adjusted income distribution in both 1963 and 1969, the distribution of adjusted income in 1969 is more unequal than the same distribution in 1963, as can be seen from the new set of Gini coefficients presented above. This is also evident from Figure 2.3, where the Lorenz curve of the 1969 adjusted income distribution lies clearly outside the 1963 Lorenz curve and farther away from the line of perfect equality. As the distributions of money income in 1963 and 1969 are practically the same, and with the new finding that the adjusted income distribution in 1969 is more unequal than the adjusted income distribution of 1963, one can confidently say that the income distribution of Thai households has deteriorated rather than improved. This is the case despite a marked increase in the rate of growth of the gross national product over the six years from 1963 to 1969.[39]

Two tentative reasons can be offered to explain this phenomenon. First, as income in-kind is accrued to rural households relatively more than urban households and is the most important income element that substantially raises the income positions of the lower income brackets, the fact that

adjusted income distribution is worsened in 1969 compared to 1963 could mean that lower income households are deprived of opportunities to receive this nonmoney income. This is possible if a large number of rural poor families imigrate into cities or urban areas and face the usual unemployment problems and other living hardships. At the same time, they are foregoing their usual income in kind in the form of food grown for own consumption. There is no study to substantiate the exact extent of rural to urban migration in Thailand, but the existence of such migration has been a well-known fact in the past ten years.

Second, the urban wage and salaried earners, particularly the self-employed modern entrepreneurs, have become much better off economically also in the past ten years relative to the self-employed farmers. This could contribute to the situation where the total income positions of the upper income brackets are rising too fast for the lower income brackets to catch up, thus widening the existing income gap instead of narrowing it.

As has been discussed, two income concepts are available to this study: money income and adjusted income. Which of these should be used? Despite its extended coverage, one must always realize that the adjusted income concept is more or less an artificial figure incorporating various elements of arbirtrary adjustments. As such, it should not be taken as the sole legitimate income concept to be used in a budget incidence study. The best policy seems to be to use both money income, which is derived more or less objectively from

the surveys, and adjusted income, which is more artificial but more complete, as bases for this incidence study.

The use of both income bases in this study has another advantage: It gives the range within which the income redistributional effects of the public sector can be examined. To elaborate, suppose that the burden of the total tax system on a representative household in income class A amounts to 50 percent of its money income compared to a burden of 25 percent for a family in income class B. On a money income basis alone, it would appear that households in income class A are taxed twice as heavily as households in income class B. However, when an adjusted income base is used to compute the relative tax incidence, it is found that households in income class A bear a total tax burden equal to 20 percent of their adjusted income, whereas households in income class B bear a total tax burden equal to 15 percent of their adjusted income. In this case, then, the relative tax burden that falls on households in income class A is only about 33 percent higher than the relative tax burden of households in income class B. The "band" of differential tax incidence, therefore, ranges from 33 to 100 percent depending upon the income concepts used.[40] Thus, the use of adjusted income as another income base gives a more accurate picture of the incidence of fiscal activities than does using either of these income bases alone.

Summary and Conclusions

This chapter began with a general discussion of the conceptual and statistical difficulties facing a researcher attempting to estimate the distribution of income in an underdeveloped country. Despite many formidable obstacles, such an estimate is possible, and if carefully done it can be quite reliable. In Thailand the workable sources of data are two sample household surveys conducted in 1962-1963 and 1968-1969. From these two surveys, and the information on the number of households from two population censuses, the money income distribution for each year has been estimated. The result shows that, using the Gini concentration ratio as the chosen index of income inequality, the money income distribution in 1969 is slightly less unequal than that in 1963, but, overall, both income distributions were very unequal by any standard.

To build a more complete income base, various income adjustments have been carried out. First, the already estimated money income was used as the basic element of personal income in the national income accounting sense. It was then adjusted for the underreporting of income and for imputed rents. Other major adjusting elements included income in kind, net corporate retained earnings, and indirect taxes. The final comprehensive income concept, termed "adjusted income," was shown to be similar in principle to the "adjusted family income" concept used by Joseph Pechman and Benjamin

Okner in their study of United States tax incidence for 1966. The new adjusted income distribution shows considerable improvement in equality over the money income distribution because the income of the lower income brackets has been augmented, mostly through income in kind. The distribution or adjusted income in 1969, however, has become more unequal since 1963. Both money income and adjusted income will be used as bases for computing the effective rates of tax burden and expenditure benefits discussed in the next two chapters.

In conclusion, it should be stated that although the income estimates obtained in this study are the result of a very careful investigation, they cannot claim to be the definitive estimates of income distribution in Thailand. The basic survey data used for computing the income distribution have many defects. For example, income classifications were inconsistent between rural and urban households, income is considerably underreported, and nonmoney income does not receive adequate attention. While the income of the lower and middle income classes is presumably adequately tabulated, the income of the upper income groups probably is not. If anything, the present income distribution estimate probably does not overstate the income position of the lower income groups; rather, the income positions of the upper income groups, especially the highest one in this study (Baht 18,000 and over), is more than likely biased downward.

A final remark as to the nature of income distribution thus far estimated in this study should be made. This income

distribution is known as a "pre-fisc" or original income distribution; it shows the relative income positions of households by income classes before the effects of taxes of all kinds are deducted and the real benefits of government expenditures converted into money terms are added. It is the distribution which would have prevailed if the Thai government were to substitute the present tax and expenditure programs with an income-proportional tax and expenditure program.

In anticipation of what is to follow in Chapters 4 and 5, it should be noted here that the term "post-tax" income distribution is reserved for the pre-fisc distribution, where the absolute tax burdens have been deducted. By the same token, a "post-benefit" income distribution is the resulting income distribution when the monetized benefits of government expenditures have been added to the pre-fisc income distribution. Finally, the "post-fisc" income distribution is obtained when the net benefits of government fiscal activities--that is, expenditure benefits minus tax burdens--are added to the pre-fisc income distribution. The extent of income redistribution of the entire fiscal system, therefore, is seen through comparison of the pre-fisc and the post-fisc income distributions.

FOOTNOTES

[1]This chapter deals strictly with the problems and procedures of the estimation of income distribution; it is not concerned with the theories of income distribution or the explanation as to why the income is so distributed in a particular way. Neither is it concerned with the sources of income disparities within various sectors of the economy. These are certainly important, but they are beyond the scope of this study. For a concise summary of the theories of income distribution see, for example, Martin Bronfenbrenner, Income Distribution Theory (Chicago: Aldine Atherton, Inc., 1971), Chapter 3; Jan Pen, Income Distribution (New York: Praeger, 1971), Chapter 6.

[2]Henry C. Simons, Personal Income Taxation (Chicago: University of Chicago Press, 1938), p. 50.

[3]Robert M. Haig, "The Concept of Income" in The Federal Income Tax, ed. R. M. Haig (New York: Columbia University Press, 1921), p. 26.

[4]That the sources of data are divided into four categories does not imply that each source is entirely independent of one another. Indeed a combination of techniques using some or all of the above data sources is common and has been used by many investigators especially in the situation where no single data source is sufficient or is decidedly better than the others. Research ingenuity is required here to see which information is needed and how to get it. Two good examples of the use of these techniques are the studies by Milton C. Taylor and associates and by Charles E. McLure, Jr. on the Colombian income distribution in 1962 and 1970 respectively. In these studies the sources of data included, among other things, the tax rolls, the national income accounts, the urban population surveys, surveys of urban industrial workers, the agricultural household surveys, the estimates of the labor force, and the population census. See Milton C. Taylor et al., Fiscal Survey of Colombia, a Report Prepared under the Direction of the Joint Tax Program, (Baltimore: published for the Joint Tax Program of the Organization of American States and the Inter-American Development Bank by the John Hopkins University, 1965), and Charles E. McLure, Jr., "The Incidence of Colombian Taxes, 1970," Discussion Paper No. 41, Rice University, summer, 1973 (Mimeographed).

[5]Harry T. Oshima, "Income Inequality and Economic Growth: The Postwar Experience of Asian Countries," Malayan Economic Review, 15 (October, 1970), pp. 7-41.

[6]United Nations, Economic Commission for Asia and the Far East, The 1971 Economic Survey of Asia and the Far East (Bangkok, 1972), Chapter 3; Idem., Interregional Trade Projection, Effective Protection and Income Distribution. Volume III: Income Distribution (Bangkok, 1972), part 6.

[7]Udom Kerdphibule, "Income and the Distribution of Income of Agricultural Sector," Thai Journal of Agricultural Economics, 11 (December, 1972), pp. 1-24.

[8]For example, the data that Kerdphibule claimed to be 1970 data were actually the 1968-1969 data. The treatment of the mean incomes of the two open-ended brackets in 1963 were rather crude. One was also surprised at the acceptance without any reservation of the distribution of income of rice farmers in the Central Plain even when the data were gathered from the survey of a single village of less than 300 families.

[9]William A. McCleary, "Sources of Change in Distribution of Income in Thailand, 1962/63 and 1968/69," Discussion Paper No. 26, Faculty of Economics, Thammasat University, August, 1972 (Mimeographed).

[10]Dr. Oey Astra Meesook, who is probably the best known authority on income distribution in Thailand today, has consented to supply some of her unpublished income distribution data for use in this study.

[11]The information from the reports of this Survey would be used for the fiscal year 1963. Also for comparison purposes, the town-village classification would be taken to mean the same as urban-rural classification.

[12]In the 1968-1969 household expenditure survey, only the average annual money income figures were given, and they were consistent with the income class limit (no class jumping). In most cases, the average income of each class was very close to the midpoint of that class.

[13]There is no sacrifice in the analysis, however, because the aim of this study is to deal with fiscal incidence at the national level only. Only the national distribution of income would be needed.

[14]Specifically, the proportion of the average income of the bottom class to that of the next higher class in 1969 is about .40, and the proportion of the average income of the second top bracket to that of the top bracket is about .45. However, the latter figure represented the urban income only.

For the country as a whole, this proportion would be less because it was likely that the average income in the rural top bracket would be slightly less than that in the urban top bracket. A ratio of .46, then, would be more appropriate. When these ratios were used to multiply the midpoints of the second bottom and the second top brackets in 1963, the results were 1800 and 117,500--the mean incomes of the bottom and the top income classes in 1963 respectively. Bracket by bracket, the 1963 average income was larger than that in 1969 which should not be. But no adjustment was made for fear that the distribution pattern in 1963, which was of interest here, might be affected.

[15]Discussions on the Pareto distribution could be found in Jan Pen; Lawrence R. Klein, An Introduction to Econometrics (Englewood Cliffs, N. J.: Prentice-Hall, 1962); H. Lydall, The Structure of Earnings (Oxford: Clarendon Press, 1968).

[16]To estimate the minimum income, Y_o in the Pareto distribution, the quantile method was used. This method requires that, first, two probability levels, P_1 and P_2 be chosen which correspond to two levels of income, y and y_2. P_1 and P_2 are simply the percentages of the total households having income less than y, and y_2 respectively. Then from a form of the Pareto function:

$$P_1 = 1 - \left[\frac{yo}{y_1}\right]^b \quad \text{and} \quad P_2 = 1 - \left[\frac{yo}{y_2}\right]^b$$

the parameter b was first solved through:

$$b = \frac{\log (1 - P_1) - \log (1 - P_2)}{\log y_2 - \log y_1}$$

When b was substituted into one of the above equations, y_o could be solved.

Using this method for the 1963 data, b was estimated to be 1.4672 and the minimum income was Baht 1,918. This parameter could also be estimated through the least square method from the linear transformation of the Pareto function, thus:

$$\log N_y = \log A - b \log y$$

which gave a slightly lower value of b at 1.4524.

For the mean income of the top income bracket, the Pareto function could be used first, to compute the total income of this bracket from the equation:

$$y_{top} = \int_{y_{ft}}^{\alpha} \left| \frac{dNy}{dy} \right| y$$

$$= \int_{y_{ft}}^{\alpha} ybay^{-b-1}\, dy = -\frac{bA}{1-b} (y_{ft})^{1-b}$$

where y_{top} is the total income of the top open-ended bracket; dNy/dy is the number of families having income y; and y_{ft} is the floor income of the top income bracket. When the total income is known, a division by total families in this bracket will yield the average income for this bracket. For 1963 such an average income of the top bracket for the whole kingdom was estimated at Baht 248,083. This extremely large average income of the top bracket, coupled with the also very large average income of the bottom bracket was unacceptable in this study. Subsequently, they were abandoned. For the discussion on the estimation methods of the Pareto distribution, see Richard E. Quandt, "Old and New methods of Estimation and the Pareto Distribution," Metrika, 10 (1966), pp. 55-82; William R. Cline, Potential Effects of Income Distribution on Economic Growth (New York: Praeger, 1972), pp. 58-64.

[17]See, for example, Mary Jean Bowman, "A Graphical Analysis of Personal Income Distribution in the United States," American Economic Review, 35 (September, 1945), pp. 607-628.

[18]See Cline, pp. 62-63. It must be mentioned here that perhaps the average income of the top bracket derived from the Pareto distribution did not overestimate the true income but the average income from the survey underestimated the true average income of this group. This is quite understandable because either the income of the top group could exist in many diverse forms which were not accounted for, or the survey did not get a fair representation of the wealthy families. Since there is no reason to overhaul the entire data and build a new artificial distribution according to the Pareto function, the survey figures would still be used for reference.

[19]Thailand, National Statistical Office (NSO), Report of the Socio-Economic Survey 1968-1969. (Bangkok, 1974).

[20]Ibid., p. 25.

[21]Thailand NSO, Report of the Household Expenditure Survey 1962/63: Whole Kingdom (Bangkok, 1966), p. 34. Hereafter, the term family will be used interchangeably with household.

[22]See Appendix B for details on how the total number of households by income class in 1969 was obtained.

[23]See Oey Astra Meesook, "Income Distribution Statistics for Thailand, Malaysia and Indonesia," paper prepared for the Princeton-Brookings Income Distribution Project, August, 1974 (Mimeographed), p. T16. One of the results of this official adjustment would make the distribution of income appear less unequal.

[24]M. O. Lorenz "Methods for Measuring Concentration of Wealth" Journal of the American Statistical Association, 9 (June, 1905), pp. 209-219.

[25]As one may not have adequate observations to plot as many coordinates as one wishes for the purpose of a smooth curve, this curve was drawn using the freehand drawing technique joining the available observation points aiming at the smoothest curve possible.

[26]Apart from the standard statistical measures of variations which are found in most textbooks on statistics, see Amartya Sen, On Economic Inequality, (Oxford: Clarendon Press, 1973); O. Elteto and E. Frigyes, "New Income Inequality Measures as Efficient Tools for Causal Analysis and Planning," Econometrica, 36 (April, 1968), pp. 383-396; A. B. Atkinson, "On the Measurement of Inequality," Journal of Economic Theory, 2 (1970), pp. 244-263; Harry T. Oshima, pp. 7-41, Henry Theil, The Information Theory, (Amsterdam: North Holland, 1967), Chapter 4.

[27]See C. Gini, "Measurement of Inequality in Incomes," Economic Journal, 31 (1921), pp. 124 - 126; also his "On the Measure of Concentration with Especial Reference to Income and Wealth," paper delivered before the Cowles Commission in 1936.

[28]See D. G. Champernowne, "A Comparison of Measures of Inequality of Income Distribution," Economic Journal, 84 (December, 1974), p. 787.

[29]N. C. Kakwani and N. Podder, "On the Estimation of Lorenz Curves from Grouped Observations," "Efficient Estimation of the Lorenz Curve and Associated Inequality Measures from Grouped Observations," International Economic Review, 14, (June, 1973), pp. 278-291; Idems, World Bank Development Research Center, Discussion Paper No. 10, October, 1974 (Mimeographed). The method used in this study was taken almost exclusively from their second article. It must be gratefully noted here that the use of Kakwani and Podder method was suggested and assisted to the author by Drs. Byron Brown and Daniel Saks, two of the members of his thesis committee.

[30]Hereafter, the KP method will be used to generate not only the Lorenz curve of pre-fisc income distribution, but also Lorenz curves of post-tax, post-benefit, and post-fisc income distributions. The Gini concentration ratios will likewise be estimated. The meaning of these terms will be explained at the end of the chapter.

[31]In the United States and most Western economies, the Gini coefficients usually range between .3 and .4. Any country with a Gini ratio higher than .4 is usually regarded as having more than "acceptable" level of income disparities. However, such simple-minded comparison of Gini coefficients among countries is fraught with danger due to differences in the income concepts, the size of households, the characteristics of heads of households, the time periods under study, the reliability of income estimates, and even in the methods used to compute the Gini coefficients. Therefore, such comparison will not be attempted here.

[32]Joseph A. Pechman and Benjamin A. Okner, Who Bears the Tax Burden (Washington, D. C.: The Brookings Institution, 1974).

[33]There are certainly more items of adjustments in the money income concept such as the imputed interest, the unshifted portion of the corporate income tax, the contributions to the social security system, but for Thailand, such adjustments could not be made because (a) the imputed interest data are not available; (b) the corporate income tax was relatively small, and since the standard incidence assumption was a total forward shifting, it is of no concern here; and (c) Thailand has yet to have a social security system. It is admitted, however, that the effect from the failure of these adjustments, if any, would be the understatement of the upper income classes, particularly the top income group.

[34]Thailand, National Economic and Development Board (NEDB), National Income of Thailand, 1968 ed. and 1972-73 ed. (Bangkok, 1970 and 1974).

[35]See Thailand, NSO, Report of the 1970 Population and Housing Census, (Bangkok, 1974), Table 5 of Housing Section.

[36]These figures were derived from multiplying the mid-points of each rent class by the total number of households in that class. The sum of these--Baht 78.0 million per month for urban areas, and Baht 30.8 million per month for rural areas--was divided by the renter households of 296,243 families in urban areas and 176,036 families in rural areas to arrive at the average actual rents mentioned in the text.

[37]See NEDB, National Income of Thailand, 1968-69 edition, pp. 10-11.

[38]This finding is directly opposite from what Pechman and Okner have found in the United States where the distribution of adjusted family income is found to have worsened over the money family income distribution. This contrasting phenomenon, however, is not difficult to explain: In a developed economy such as the United States, the most important adjusting elements in the income concept are capital gains, imputed rents and interests which accrue mainly to households in higher brackets, whereas in an underdeveloped economy such as Thailand, one of the most important income adjusting elements is the income in kind which, according to the present statistical data, enhances the income positions of the lower relative to the upper brackets. Nevertheless, Dr. Milton C. Taylor, the major advisor of this researcher, still believes that with more complete data it could be shown that income of the top income bracket is still underreported.

[39]The rate of growth of GNP in Thailand from 1963 to 1969 was estimated at 92.3 percent. See NEDB, The National Income of Thailand, 1968-69 edition, p. 23.

[40]In several tax and expenditure incidence studies, alternative incidence shifting assumptions were used in allocating the incidence of taxes and expenditures to various income classes to see the range of differential incidence as a result of the use of such assumptions. The use of more than one income base affects the outcome of an incidence study in the same manner as the use of more than one allocation assumption. In the fiscal incidence study in Thailand, however, the use of alternative income bases deserves greater emphasis because unlike other more-developed fiscal systems the income distribution statistics are not as reliable, and as such the use of alternative income bases is more appropriate.

CHAPTER III

THE INCIDENCE OF TAXES

Taxation may have different purposes according to the different levels of government that collect the taxes. This, of course, refers to the Musgravian tripartite division of government functions.[1] Taxes are collected by the allocation branch to be used as resources for the provision of public goods; they are collected by the distributive branch as a mean to redistribute income toward a certain "proper" pattern; and in the stabilization branch taxes serve as a means to fight inflation or deflation. Musgrave's model is a conceptually innovative device for understanding the government's revenue functions, although in practice it is difficult to see which tax is to serve which purpose. More than likely, many taxes are collected to serve three purposes simultaneously.

This chapter deals with the statistical estimation of "tax incidence," a specialized term meaning the burden of taxes and other governmental revenues distributed by size classes of income. Following the example set forth by Musgrave et al.,[2] the burden of taxation will be defined as the difference between a taxpayer's actual money income net of tax and what this income would be in the absence of the

tax. In other words, a tax burden is synonymous with a reduction in the taxpayer's real income. Several issues involved in the process of tax incidence estimation will be discussed below. First, certain theoretical problems inherent in a study of this sort must be confronted. Second, a decision must be made as to which government revenue programs will be covered and, third, how each tax is to be allocated to which income group. The significance of the empirical results obtained will be discussed at the end of the chapter.

Theoretical Problems in Tax Incidence Studies

Despite the apparent ease of the tax incidence estimating procedure, that is, the apportionment and allocation of the tax burden in money terms among income groups, a tax incidence study creates numerous theoretical problems. According to conventional methods used in tax incidence studies, the tax burden borne by each income class is subtracted from the income of an individual or household in the same income class to arrive at a new pattern of income distribution: the after-tax or post-tax income distribution. To be able to obtain the post-tax income distribution simply by deducting the tax burden from the original, pre-tax (or pre-fisc) income levels, one might have to make a strong assumption that the pre-tax income distribution would remain unchanged in the absence of the government or the tax programs.

This assumption is sometimes referred to as a zero-government or zero-tax counterfactual assumption.[3]

An objection to this counterfactual assumption has been raised by Alan R. Prest, who claims that such an assumption is so unrealistic that it renders the conventional tax incidence study meaningless.[4] This opinion has been supported by Carl S. Shoup, Richard M. Bird and Luc De Wulf.[5] It is difficult to defend the assumption against this criticism, since it is quite obvious that the existing pattern of pre-tax income distribution already has been influenced by the continuing presence of the government or the previous tax policies. Furthermore, if all taxes were abolished or repealed, the price and income effects would send a wave of adjustments throughout the income structures of households which only coincidentally might remain the same as before the repeal.

Nonetheless, Musgrave, who was among the first economists to undertake a tax incidence study in the United States, has developed a strong defense.[6] He claims that, instead of assuming a zero-tax system, or "thinking" away taxes, the adjustments resulting from the repeal of taxes could be assumed to be distributionally neutral. Or the "differential incidence" approach could be adopted whereby the present tax system is assumed to be replaced by a proportional tax system which yields equal revenues. Post-tax income distribution then could be compared with that

income distribution which would have resulted if the substituted proportional taxes were in effect (which, incidentally, would be the same as the existing pre-tax income distribution). This differential incidence argument is very simple yet very convincing. Its use obviates the need to be too concerned about this particular conceptual difficulty in conventional tax incidence studies. Indeed, most tax incidence studies conducted since that of Musgrave and Associates in 1951, including the present study, explicitly or implicitly have adopted this assumption.

Other problems remain, however. A more important theoretical criticism maintains that the only proper procedure in a tax incidence study is to take account of the total effects of taxation on relative prices and income. In other words, these critics favor the general equilibrium model in analyzing the effects and repercussions from the imposition of a tax on relative prices and income throughout the economy. The pioneering general equilibrium tax incidence model of A. C. Harberger is often cited as an example of what a proper tax incidence study should be.[7]

This criticism can be answered on the ground that a general equilibrium analysis is not empirically feasible. Although the model offers greater realism and precision than the partial equilibrium model, which is used in most conventional tax incidence studies, general equilibrium incidence research is very difficult if not impossible to carry out

in practice. The estimation problems are insurmountable. To adopt the qualitative method suggested by C. S. Shoup, that is, to make a logical deduction concerning tax effects in the general equilibrium setting, is still no better a procedure than the judicious interpretation method of conventional tax incidence study based on partial equilibrium analysis.[8] Furthermore, a general equilibrium incidence model is based on many simplifying assumptions, the validity of which can be seriously questioned. Therefore, partial equilibrium analysis will continue to be used as the standard method in calculating the incidence of taxation.[9]

A General Methodology

The fact that this research in an intertemporal study of tax incidence almost completely invalidates any criticism that the zero-government counterfactual assumption might be implicitly assumed. The main emphasis of this research is no longer placed on the isolation of pre-tax and post-tax distributions of income--the main objective of a conventional tax incidence study--but on the comparison of post-tax distributions of income between two years. Most critics of traditional incidence studies admit that "comparisons (of incidence) over time are conceptually easier,"[10] and that "tabulations purporting to show the distribution of burden of a total tax system by income classes, under certain

assumptions about shifting and incidence, are useful only as two or more such tabulations are compared, to show changes in the distribution of the burden when taxes are changed."[11] The intertemporal approach constitutes an obvious improvement in methodology: If errors are made in assigning tax burdens to specific income groups, it is quite possible that such errors are constant from one year to another. An intertemporal study, therefore, removes most of the conventional criticisms.

In general, the following estimation procedure will be used here: (1) taxes and other governmental revenues in 1963 and 1969 will be selected; (2) each major tax or revenue will be discussed as to its shifting assumptions and burden allocation rules; and, (3) after the burden of each tax is allocated to various income classes, the total pattern of incidence will be assessed and the redistributive effects of government tax policies between 1963 and 1969 will be compared.

Selection of Taxes

Several views must be considered in selecting which tax or revenue source to study. Up to this point, the term "tax" as used in "tax incidence," for example, has connoted the compulsory aspect of government revenue programs. This usage conforms to the belief that only compulsory items levied for the purpose of raising revenue for general expenditure should be included, and those fees and sales

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proceeds from public enterprises should be excluded. The rationale is to consider only that part of government fiscal activity which poses a "burden" to households, not the so-called quid pro quo portions from which specific and direct benefits are derived in exchange for family payments to the government.

A second point of view argues that it is sometimes difficult to determine which taxes are based on the benefit principle and which taxes are not; the distinction between fees and taxes is not always clear. A case in point is the payroll tax, which could be considered either a quid pro quo payment or a burden. Moreover, the alleged benefits received from a government service often are not perfectly related to the payments, thus creating some burdens. It also can be argued that many charges do not represent a payment for a service that would be sold by a private firm: in the absence of government, for example, road fines also would probably be absent. This view, therefore, would include both taxes and fees in a study.

The third viewpoint advances a step farther and maintains that if the study aims at an overall investigation of government fiscal activities, that is, the incidence of tax burdens as well as expenditure benefits, the selection of taxes should be as comprehensive as possible. Not only those taxes defined as compulsory revenue sources, but also all other government revenue sources, such as fees, proceeds

from governmental sales and services, and profits from government enterprises, should be examined. If only some revenue items are included when the distributive impact of both taxes and expenditures is being measured, the incidence would be distorted.

This third position is adopted here because it is the most appropriate for a total fiscal incidence study such as this one. Consequently, what previously has been referred to as "tax incidence" now should be interpreted to include the incidence of taxes and other government revenue items as well. Henceforth, "taxes" will be used as a convenient term for actual taxes, public fees, royalties, and other domestic receipts of the government.

In addition to the general consideration discussed above, certain modifications must be made because the study deals specifically with Thailand. First, this study will be concerned only with the tax burden of Thai residents; any tax or revenue whose burden falls on foreigners will be excluded whenever possible. Ideally, that portion of indirect taxes which is assumed to fall on foreign tourists would be excluded, but there is no way of determining which taxes, and in what amount, are borne by foreign visitors. Therefore, no adjustment has been made. It is assumed that such taxes are small or do not substantially affect the distributive pattern of the resident tax burden.[12]

Second, only that fiscal activity over which the central government of Thailand has full control is deemed to

be of interest here. Government revenues from foreign grants or loans and other types of technical assistance are excluded. Of course, these revenues have a redistributive impact on Thai households, but this influence is assumed to be distributionally neutral.

Third, the question arises as to whether domestic borrowing should be included in the revenue analysis. If the study is concerned with tax incidence alone, then the income distributive effects of internal public debts should be included. In a total fiscal incidence study such as this one, however, the question of including internal public debt could be postponed until both the tax and expenditure incidence patterns are known.

Table 3.1 presents the total taxes and other revenues collected by the Thai government from resident households in 1963 and 1969. Overall, the amount collected in 1969 more than doubled that of 1963, rising from Baht 8,807.3 million to Baht 18,525.2 million. In both years, import duties accounted for the highest share of tax collections: 31.4 percent in 1963 and 28.6 percent in 1969. The next largest category was business taxes, with 17.7 and 18.5 percent respectively. The revenue from selective sales taxes jumped impressively in 1969 over 1963, but this was partly due to the inclusion of taxes on fuel and oil, previously classified under import duties. The share of rice premiums or ad valorem taxes on rice exports dipped

Table 3.1--Total Adjusted Taxes and Other Government Revenues, by Type, 1963 and 1969 (Amounts in Millions of Baht)

Type of Taxes	1963		1969	
	Amount	Percent	Amount	Percent
Individual Income Taxes	468.2	5.3	1,119.5	6.0
Corporate Income Tax	312.2	3.5	851.1	4.6
Business Taxes	1,561.3	17.7	3,490.5	18.8
Selective Sales Taxes	400.5	4.5	2,521.1	13.6
Import Duties	2,764.3	31.4	5,294.0	28.6
Rice Premiums	798.4	9.1	1,235.6	6.7
Other Export Taxes	363.2	4.1	424.3	2.3
Taxes on Property	147.4	1.7	390.1	2.1
Royalties and Permits	422.0	4.8	691.9	3.7
Gov't Sales and Services	322.0	3.7	361.1	1.9
Gov't Monopolies	776.1	8.8	605.3	3.3
Gov't Enterprises	226.3	2.6	636.4	3.4
Other	245.4	2.8	949.3	5.1
Total	8,807.3	100.0	18,525.2	100.0

Source: Thailand, Department of Comptroller General, Reports of Receipts and Outlays of the Kingdom of Thailand, 1963 and 1969.

slightly in 1969 compared to 1963, as did other export taxes.

One striking fact about the tax collection pattern shown in Table 3.1 is that the individual income tax contributed only 5 to 6 percent to total tax collections in 1963 and 1969. This is extremely low by world standards. The corporate income tax was also relatively low, comprising less than 5 percent in 1969. Taxes on property, which could partly be classified as direct taxes, were very small, accounting for 1.7 and 2.1 percent of the total tax collections in the two years under study. The remaining collections could be grouped as nontax revenues of the government, and together they amounted to about 20 percent of total tax collections in each year.

Allocation of Tax Burdens

Once the taxes and other revenue sources are selected, the next task is to allocate their "burdens" to household units grouped according to size classes of income. But first one must decide who should bear the brunt of the burden: consumers, producers or factor owners. As a rule, if there is any empirical evidence as to who actually bears the burden, it should be used. If not, then some theoretical justification must be relied upon. This problem is concerned with what is known as the shifting of taxes or tax incidence. In partial equilibrium analysis, whether or not the tax burden is shifted, or in what direction, depends upon many

factors, such as the nature of the tax, the elasticities of demand and supply of the taxed products and the factors of production, and so on. This aspect will be analyzed in greater detail when each tax is discussed.

The next step is to translate these allocations by economic categories into allocations by households classified into various income classes. For example, if it is decided that the tax on tobacco is shifted entirely to tobacco smokers, then this tax will be further allocated to households according to the pattern of their expenditures on tobacco products. This and other distributive patterns are normally obtained from household expenditure surveys.

In Thailand, the 1962-1963 household expenditure survey and the 1968-1969 socio-economic survey provide the necessary data for the allocation of taxes to households by income classes. These surveys give the average expenditure on each commodity group by each representative family in different income classes. The eight commodity groups on which household income was spent in 1963 and 1969 were: food, dwelling (household goods and household operations), clothing, transportation; education, reading and recreation; medical and personal care, alcoholic beverages and tobacco, and miscellaneous expenditures. When the average expenditure is multiplied by the total number of families in that income class, the result is the total expenditure of that income class on each particular commodity group. This pattern of

household expenditures by income classes serves as a base upon which most taxes are allocated. (See Appendix D for detail.)

When certain taxes cannot be properly allocated to households according to the available expenditure patterns, other allocation rules must be used. For example, taxes on rice exports, which are believed to fall on farmers, are allocated to households according to the pattern of distribution of rural income; taxes on private passenger cars are allocated entirely to the top income group; and so forth. These and other allocation formulas or rules together form the bases upon which the tax burdens are distributed in this analysis.[13]

The foregoing methodological procedure can be stated mathematically. Assuming that:

$i = 1, \ldots, l$ is the income class;

$j = 1, \ldots, m$ is the type of tax;

$k = 1, \ldots, n$ is the commodity group upon which expenditure is made and the pattern of which is used as the allocation formula;

b = absolute tax burden;

e = household expenditure; and

t = absolute amount of tax;

then, it is true that:

$$b_{ji} = \sum_{k=1}^{n} t_{jk} \cdot w_{ki},$$

where:

$$w_{ki} = e_{ki} / \sum_{i=1}^{1} e_{ki},$$

and:

$$B_i = \sum_{j=1}^{m} b_{ji},$$

where:

b_{ji} = the burden of tax j on a household in the income class i;

w_{ki} = the share of income class i in the total expenditure on commodity group k;

t_{jk} = the absolute amount of tax j collected from commodity group k; and

B_i = total tax burden borne by income class i.

From the above, it follows that the effective tax rate of income class i would be represented as B_i/Y_i, where Y_i is the total household income of income group i.

The Analysis of Taxes

The following section will discuss each major tax in turn, taking into account the tax shifting assumptions and the problems encountered in the actual allocation of burdens in each year.

Individual Income Tax

Regarding who should bear the burden of individual income taxes, the commonly accepted view is that the income

earner bears the entire burden. The reasoning is rather obvious, since most people usually do not have the opportunity to shift such a burden directly to others, especially in the short run. Theoretically, this is equivalent to assuming that the factor supplies--in this case labor alone--are perfectly inelastic, which is not at all so restrictive an assumption as it might seem. It is often argued that taxes on income reduce work effort, thus changing the pattern of earning and income distribution. But, as Musgrave has shown, the work effort could increase, decrease, or remain unchanged depending upon the strength of the income and substitution effects.[14] If it is assumed that the change in income distribution due to the initial change in the work effort (before final adjustment) is neutral, then the assumption that the individual income tax rests with the intial payee is plausible.[15]

The Revenue Department of the Ministry of Finance was responsible for collecting personal income taxes in 1963 and 1969, and statistics showing the amount of tax received from each taxable income class were made available in the Annual Report of that Department. By adjusting the 1969 taxable income classes to coincide with the household income classes used in this study, the amount of tax by desired income brackets can be estimated. Switching from the actual tax received by the Revenue Department by taxable income brackets to family income brackets reduces the amount

of tax per family considerably because only a small fraction of households which were supposed to pay tax actually did so. Inefficiencies in both tax administration and enforcement were to blame for this low income tax collection.

Since no revenue data were available for 1963, an assumption had to be made that the pattern of tax payment was approximately the same in that year as for 1969. As a result, approximately 97 percent of the total personal income tax was allocated to the top income class in 1963, and the rest to the second highest income bracket.

Corporate Income Tax

Perhaps the single topic in taxation that has prompted the most extensive debate is the incidence of the corporate income tax. Traditionally it is held that a firm in a purely competitive market with a profit maximization objective cannot shift the burden of the corporate profit tax in the short run because such a tax does not affect optimum output and production. Therefore, the tax burden will fall entirely on profits. However, if the market is imperfect, or if the objective of the firm is not profit maximization but sales maximization, or some "satisficing" objective, the traditional view loses something of its validity. When Marian Krzyzaniak and Richard Musgrave showed econometrically in 1961 that the firm could and did fully shift the corporate tax forward, even in the short run, the traditional view was seriously challenged. Furthermore,

they also ushered in an era of numerous studies both supporting and disagreeing with this interpretation, and the controversy continues.[16]

It is not the intention of this study to discuss, or even to review, the debate on the incidence of the corporate income tax.[17] Suffice it to say that the results are still inconclusive as to how much of this tax should be shifted forward in terms of higher product prices or backward in terms of lower wages and salaries. A researcher must use his own judgment as to what will be the likeliest shifting assumption in a particular economic setting.

In previous tax incidence studies, most economists assumed that the burden of the corporate income tax was shared between the consumers of the firm's products and the firm's shareholders. But as there appears to be no compelling rule about how to apportion the shares, this study assumes that all of the corporate income tax in Thailand is shifted forward to consumers and none is borne by corporate owners or workers.

In Thailand, where the market is far from perfect and where cost-plus or full-cost pricing is normally the practice, the 100 percent incidence shifting assumption is not at all unreasonable. In their study of tax incidence in Latin America, Bird and DeWulf commented: " . . . the absence of a full shifting assumption among the great variety of assumptions used is curious," and " . . . it would still

seem as valid to assume full forward shifting as some other arbitrary percentage on the basis of existing evidence for Latin America."[18] The full shifting assumption also was used in the study by Jay S. Salkin of tax progressivity in Thailand.[19] The adoption of this assumption also eliminates the need for adjustment in the income comcept for the unshifted portion of the corporate income tax.[20]

The allocation of the corporate income tax in Thailand used the following procedure. First, corporations were broken down by types of commodities or services sold and the amount of taxes paid. This information was available directly from the Revenue Department in the form of tables showing the amount of corporate tax received by types of business activities. (See Appendix E for detail.) Each of these taxes was then allocated to households by income classes according to the pattern of their expenditures on the taxed products. In cases where the product and the tax were not exactly matched, some judgments were made as to what proportion of the tax should be allocated and on what allocation bases. For instance, there was no allocation base available for consumption expenditure on cement, so 25 percent of the tax on the profits of cement companies was arbitrarily allocated as expenditures on household operations, 25 percent on transportation (road building), and 50 percent on the total expenditure pattern.

Although the actual corporate income tax collected in 1969 was known, the detailed breakdown of such tax by

business activities was available only up to 1968. To obtain the same breakdown for 1969, it was assumed, then, that the pattern of tax collected in 1969 was exactly the same as that in 1968. This assumption enables the 1968 pattern to be used for 1969.

Business Taxes and Stamp Duties, Selective Sales Taxes, and Import Duties

The most important instances of indirect taxes are business taxes, stamp duties, selective sales taxes and import duties. Their burdens are assumed to be shifted fully to the consumers of taxed products or services. This assumption is widely accepted, and most studies have adopted it without questioning its theoretical justification. But it is this indirect tax assumption in relation to the direct tax assumption discussed earlier that, according to A. R. Prest at least, threatens the very foundation of conventional tax incidence studies. Prest pointed out that for an indirect tax to be shifted fully forward, either the supply of the taxed product must be infinitely elastic or its demand completely inelastic. This, of course, runs counter to the direct tax case, where factor supply is assumed to be completely inelastic or factor demand perfectly elastic. In a study of short-run incidence, the use of these two assumptions would be incompatible.[21]

Musgrave, however, argues that the supply of the consumer goods does not have to be infinitely elastic for the

full shifting assumption to apply. Imagine a situation where two persons have a proportional tax levied on their income. Suppose such a proportional income tax is substituted by an excise tax of equal yield on one of the commodities which is purchased and consumed by one and not the other taxpayer. It is obvious that only the consumer of the good being taxed bears the full burden of the excise.[22] A. B. Cartter also advances an argument supporting the full shifting assumption, maintaining that the government could use the indirect tax proceeds of any one commodity to buy a sufficient quantity of that commodity to keep output unchanged. In this case, where compensating government expenditure is assumed, prices can be thought to rise by the exact amount of indirect taxes without requiring either the supply to be perfectly elastic or the demand perfectly inelastic.[23]

Although, as Earl Rolph has demonstrated, the burdens of indirect taxes could shift backward to factor owners,[24] the shifting magnitude is uncertain and the reasoning less convincing than the traditional assumption. In Thailand, as in most other underdeveloped countries, the basic wage rates are already very low, so the possibility that these taxes will have further depressing effects on wages is very slim. Therefore, in this study the incidence of business taxes, selective sales taxes, and import duties will be assumed to be shifted fully forward to consumers of the taxed products or services.

The aforementioned taxes were allocated to consumers in various income classes according to the patterns of their expenditures on the selected eight commodity groups, and few other allocation bases. Some details concerning the empirical problems involved in allocating these taxes are discussed below. (See also Appendix E for detail.)

Business Taxes

The disaggregated data on the amount of business taxes collected by types of business activities were available from the Revenue Department. Business activities were roughly classified into 13 categories and further classified into subcategories (see Appendix E). These classifications permit the taxes to be allocated according to the established pattern of expenditures on commodities and services fairly easily. As in the case of the corporate income tax, a few categories of taxes could not be readily allocated on the basis of any specific commodity group, and subjective judgment was used in allocating them to the nearest commodity group or groups. For example, taxes on oil and fuel were allocated on the basis of expenditures on household operations, transportation, and the total expenditure pattern.

Selective Sales Taxes

Only a few commodity groups were burdened with selective excise taxes. Major commodities included beer and other

alcoholic drinks, tobacco products, cement and petroleum products. The amount of taxes collected from these products was reported in the publications of the Excise Department, the Department of the Comptroller General, and the Bureau of the Budget. With the exception of cement, petroleum products, and a few other commodity groups, the bulk of the taxes was allocated according to the pattern of household expenditures on alcoholic beverages and tobacco products.

Import Duties

Taxes on imports were reported in a most disaggregated form by the Bureau of the Budget (from the tax records supplied by the Customs Department). Imports were broken down into ten categories according to international standard classifications, which was helpful in ensuring accurate allocation (see Appendix E). Of course, problems arose with intermediate goods such as chemical compounds, minerals and other raw materials. The taxes on these intermediate goods were treated as taxes on the products which used such raw materials as main producing agents.

Export Taxes

If export taxes were to be treated in the same way as import taxes, then the burdens of export taxes would fall on foreign consumers of the exported product. But in a small exporting economy such as Thailand, this reasoning would not be valid. First, each of the country's exports

comprises only a small portion of world exports, and supply conditions are quite rigid. Second, the world demand for Thai products is believed to be very elastic.[25] These conditions constitute a compelling case for the assumption that it is the domestic producers who bear the burden of export taxes. In other words, the taxes would be assumed to be shifted backward, not forward.

Regarding Thai rice exports, which earn the largest amount of foreign exchange, considerable research has been conducted to determine who should bear the burden of rice premiums or taxes imposed on the values of rice being exported. After taking into account the demand and supply conditions and various other factors, most studies have reached almost the same conclusion that has been reached here: Thai farmers bear most, if not all, of the burden of rice premiums. Thus, rice premiums were allocated to farm households according to their share in the distribution of rural income.[26]

Regarding other Thai exports, such as rubber, tin and teak, the world demand and domestic supply situation does not differ much from rice. Thus, the burdens of taxes on these exports also were assumed to fall on domestic producers. For rubber, taxes were allocated according to the distribution of income of the rubber growers, a special distributive series derived from an agricultural census. For tin, however, the burden of the taxes was assumed to

fall entirely on the highest income bracket because most tin mines in Thailand are owned by a few wealthy families.[27]

Taxes on Property

Taxes on property as used here are not "property taxes" in the usual sense, that is, taxes on the ownership and improvements of farm lands, residential homes, business establishments, and so forth, but are simply taxes on two specific kinds of transactions: automobile ownership and the registration of real estate transfers. In Thailand, except for automobiles, which are treated as property, no other property is subject to taxes. Taxes on the registration of new ownership of real estate are not taxes on property in the real sense, but are fees that the government charges for the legalization of these transfers.

To allocate automobile taxes to various income classes, the procedure adopted requires a detail of taxes broken down by types of automobiles. This information is available in the annual report of the Police Department which is entrusted with the authority to collect automobile taxes. In this report, it was reported in both 1963 and 1969 that about 25 percent of the automobile taxes was contributed by private passenger cars, another 25 percent by public buses and taxis, and the remaining 50 percent by private trucks and other motor vehicles.

Regarding the taxes on private passenger cars, it is assumed that the owners of this type of vehicle bear the

full burden of the taxes. As the top income group is the only group wealthy enough to own a private passenger car in Thailand, households in this group were assumed to bear all 25 percent of the automobile taxes in both 1963 and 1969. Another 25 percent of the taxes originating from public transport vehicles are assumed to fall on all households according to the pattern of their expenditures on transport services, so the taxes are allocated accordingly. The incidence of the remaining 50 percent of taxes contributed by trucks are assumed to be spread over all commodities transported by trucks. Therefore, the patterns of total household expenditures in 1963 and 1969 were used in allocating this portion of automobile taxes in the respective year.

Regarding the registration of real estate, it is assumed that the income positions of households, to a great extent, determine the ownership of real estate: the wealthier the family, the more immovable property or real estate it should have. Therefore, the taxes on the registration of real estate were allocated to households in direct proportion to the share of each income class in the distribution of family money income.

Royalties and Permits, Government Sales and Services, Government Enterprises and Monopolies, and Other Miscellaneous Revenues

Determining the incidence of various nontaxed revenues of the government is not easy. The fact that these are more

benefit-based charges than taxes in the real sense casts doubt on the existence of a "burden." Nevertheless, one can certainly perceive the incidence of these revenues in terms of the money that has been paid more out of necessity than voluntarily in exchange for government goods and services. The inclusion of these revenues is much more relevant when the incidence of both government receipts and outlays is considered.

The data on goods and services for which royalties and permits are required were available from the Department of the Comptroller General and were in sufficient detail to permit an allocation to households on the basis of their expenditure pattern for such goods and services. This procedure assumed the shifting of tax burdens to consumers rather than producers with the exception of tin royalties, which were assumed to fall on producers. This latter incidence shifting assumption is consistent with the facts that the proportion of tin used within the country in relation to the total tin output is negligible, and the world demand for tin is elastic. The types of activity that require permits include the sale of liquor, lottery tickets, guns and fireworks, gambling, and alien registration. Most of the revenues from these permits were allocated on the commodity consumption expenditure pattern, but the alien registration fees were allocated according to the distribution of households on the assumption that aliens (mostly Chinese) are normally distributed throughout the income ranges.

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The burden of receipts from government sales and services was assumed to fall on those who pay for these goods and services. Again, these revenues were allocated to households according to the patterns of their consumption spending. The same allocation rule was used for other revenues from government enterprises and monopolies. This proved to be a simple procedure once it was determined that the taxes charged on the products of government enterprises and monopolies would be passed on entirely to consumers of such products.

The largest revenue items from government monopolies were the proceeds from the Tobacco Monopoly and the Lottery Bureau. The proceeds of the former were allocated to households according to the pattern of their spending on tobacco products and alcoholic beverages, and the latter according to the pattern of their expenditures on recreation.

The miscellaneous category of government revenues, consisting of fines, unused funds from various government departments, interest from loans, and other revenues, was considered item by item and the burdens allocated accordingly. For public fines, one-half was allocated according to the distribution of households and the other half according to the distribution of income. All of the left-over funds were allocated equally to each household, as it was assumed that these funds would be respent in the next year's general expenditures. Interest was allocated according to the

distribution of income, and all other revenues according to the pattern of total expenditures.

Empirical Results of Tax Analysis

Tables 3.2 and 3.3 present the distribution of absolute tax burdens by type of taxes and by income classes. This form of presentation does not show how these burdens affect income distribution. There are at least two ways in which the income redistributional results of these tax burdens can be shown. First, one can determine the effective rates of taxation by absolute income levels, a method almost universally adopted in incidence studies. Second, the income redistributional impact can be traced through changes in the patterns of income distribution after the amount of taxes is subtracted from the existing income levels. In other words, the so-called post-tax income distribution can be compared with the "pre-fisc" income distribution to see if there is any redistribution. In doing so, either a class by class comparison or a measure such as the Gini concentration ratio, or both, may be used.

Joseph Pechman and Benjamin Okner, in their study of tax incidence in the United States, have indicated a third way in which results can be presented.[28] Effective tax rates can be presented by decile (or percentile) groups. Because the first method (effective tax rates by income classes) uses an arbitrary income classification for absolute

Table 3.2--Distribution of Absolute Tax Burdens by Income Classes, 1963
(Amounts in Millions of Baht)

Type of Taxes	Income Classes (Baht)					
	Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000 and over	All Classes
Individual Income Tax	--	--	--	14.1	454.1	468.2
Corporate Income Tax	61.9	43.9	68.6	35.8	102.0	312.2
Business Taxes	376.7	255.4	386.1	196.2	346.9	1,561.3
Selective Sales Taxes	95.5	68.8	105.6	51.9	78.7	400.5
Import Duties	655.4	438.2	665.6	354.9	650.1	2,764.3
Rice Premiums	176.6	168.1	252.2	88.2	113.2	798.4
Other Export Taxes	48.2	61.6	105.2	51.4	96.9	363.2
Taxes on Property	25.0	18.5	31.0	16.3	58.6	147.4
Royalties and Permits	72.1	46.6	70.9	40.7	191.7	422.0
Gov't Sales and Services	80.0	52.0	77.0	39.2	73.9	322.0
Gov't Monopolies	187.0	136.5	208.3	99.0	145.3	776.1
Gov't Enterprises	61.4	37.7	53.4	24.8	49.0	226.3
Other	73.2	43.2	58.9	26.5	43.7	245.4
Total	1,911.0	1,370.5	2,082.7	1,039.1	2,404.1	8,807.3

Table 3.3--Distribution of Absolute Tax Burdens by Income Classes, 1969 (Amounts in Millions of Baht)

Type of Taxes	Income Classes (Baht)							
	Under 3,000	3,000-5,999	6,000-8,999	9,000-11,999	12,000-14,999	15,000-17,999	18,000- and over	All Classes
Individual Income Tax	—	—	--	3.7	13.4	23.5	1,078.8	1,119.5
Corporate Income Tax	47.8	89.5	97.0	83.1	74.6	59.1	400.0	851.1
Business Taxes	201.2	370.0	406.9	345.9	312.9	247.0	1,606.8	3,490.5
Selective Sales Taxes	150.6	270.9	316.1	263.7	239.9	196.0	1,083.9	2,521.1
Import Duties	310.2	573.7	648.0	549.3	495.8	386.5	2,330.5	5,294.0
Rice Premiums	69.2	168.4	185.7	146.5	117.8	91.1	456.9	1,235.6
Other Export Taxes	26.1	79.2	75.6	50.3	35.7	24.6	132.8	424.3
Taxes on Property	15.4	33.2	38.4	33.0	29.2	23.6	217.3	390.1
Royalties and Permits	26.9	41.3	41.0	34.1	36.4	28.8	483.4	691.9
Gov't Sales and Service	22.8	37.8	39.7	33.1	29.0	22.7	131.0	316.1
Gov't Monopolies	35.5	62.8	71.7	60.5	59.1	49.7	266.0	605.3
Gov't Enterprises	60.2	85.0	80.5	63.0	53.1	41.5	253.1	636.4
Other	172.3	186.5	140.0	95.7	71.8	52.5	230.7	949.3
Total	1,138.2	1,998.2	2,140.5	1,762.0	1,568.5	1,246.5	8,671.2	18,525.2

income levels that tends to exaggerate the significance of data in some parts of the income distribution and to diminish it in others, the third method is more attractive. It is a most useful complement to the other two methods because it can be used to compare the tax burdens of groups representing the same number or percentage of family units in different parts of the income scale. It must be pointed out, however, that Pechman and Okner had at their disposal complete observations of total households and total income (from the so-called MERGE file) which enabled them easily to compute the effective tax rates by decile or percentile groups. Unfortunately, similar data are not available in Thailand. Although it is possible to estimate a Lorenz curve of tax burdens in this study from which effective rates by decile or percentile groups could be computed using numerical analysis and computer techniques, this would be unusually complicated, and it was decided that it would not be desirable. As a result, only two methods of tax incidence presentation will be adopted here. The two are:

Effective Tax Rates by Income Classes

Effective rates for 13 different types of taxes by income classes are presented in Tables 3.4 and 3.5. These effective rates were based on the money income of households in 1963 and 1969. Tables 3.6 and 3.7 present the effective tax rates based on adjusted income of households in 1963 and 1969 respectively.

Table 3.4--Effective Tax Rates Based on Money Income by Income Classes, 1963
(Percentages)

Type of Taxes	Income Classes (Baht)					
	Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000 and over	All Classes
Individual Income Tax	--	--	--	0.3	3.9	1.4
Corporate Income Tax	1.4	0.9	0.8	0.8	0.9	0.9
Business Taxes	8.4	5.3	4.2	4.4	3.0	4.5
Selective Sales Taxes	2.1	1.4	1.2	1.2	0.7	1.2
Import Duties	14.6	9.1	7.3	7.9	5.6	8.0
Rice Premiums	3.9	3.5	2.8	2.0	1.0	2.3
Other Export Taxes	1.1	1.3	1.2	1.1	0.8	1.1
Taxes on Property	0.5	0.4	0.3	0.4	0.5	0.4
Royalties and Permits	1.6	1.0	0.8	0.9	1.7	1.2
Gov't Sales and Services	1.8	1.1	0.9	0.9	0.6	0.9
Gov't Monopolies	4.2	2.8	2.3	2.2	1.3	2.3
Gov't Enterprises	1.4	0.8	0.6	0.6	0.4	0.7
Other	1.6	0.9	0.7	0.6	0.4	0.7
Total	42.7	28.4	22.9	23.0	20.8	25.5

Table 3.5--Effective Tax Rates Based on Money Income by Income Classes, 1969 (Percentages)

Type of Taxes	Income Classes (Baht)							
	Under 3,000	3,000-5,999	6,000-8,999	9,000-11,999	12,000-14,999	15,000-17,999	18,000- and over	All Classes
Individual Income Tax	—	—	—	0.1	0.3	0.5	3.2	1.7
Corporate Income Tax	2.0	1.5	1.4	1.4	1.4	1.4	1.2	1.3
Business Taxes	8.3	6.2	5.9	5.8	6.0	5.6	4.8	5.4
Selective Sales Taxes	6.2	4.5	4.6	4.4	4.6	4.5	3.2	3.9
Import Duties	12.8	9.6	9.4	9.2	9.5	8.8	6.9	8.2
Rice Premiums	2.9	2.8	2.7	2.5	2.3	2.1	1.4	1.9
Other Export Taxes	1.1	1.3	1.1	0.8	0.7	0.6	0.4	0.7
Taxes on Property	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6
Royalties and Permits	1.1	0.7	0.6	0.6	0.7	0.7	1.4	1.1
Gov't Sales and Services	0.9	0.6	0.6	0.6	0.6	0.5	0.4	0.5
Gov't Monopolies	1.5	1.0	1.0	1.0	1.1	1.1	0.8	0.9
Gov't Enterprises	2.5	1.4	1.2	1.1	1.0	1.0	0.8	1.0
Other	7.1	3.1	2.0	1.6	1.4	1.2	0.7	1.5
Total	47.0	33.3	31.1	29.5	30.0	28.5	25.7	28.7

Table 3.6--Effective Tax Rates Based on Adjusted Income by Income Classes, 1963
(Percentages)

Type of Taxes	Income Classes (Baht)					
	Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000- and over	All Classes
Individual Income Tax	--	--	--	0.2	1.9	0.6
Corporate Income Tax	0.4	0.4	0.4	0.4	0.4	0.4
Business Taxes	2.4	2.3	2.1	2.2	1.5	2.0
Selective Sales Taxes	0.6	0.6	0.6	0.6	0.3	0.5
Import Duties	4.2	3.9	3.6	4.1	2.7	3.5
Rice Premiums	1.1	1.5	1.4	1.0	0.5	1.0
Other Export Taxes	0.3	0.6	0.6	0.6	0.4	0.5
Taxes on Property	0.1	0.2	0.2	0.2	0.3	0.2
Royalties and Permits	0.5	0.4	0.4	0.5	0.8	0.5
Gov't Sales and Services	0.5	0.5	0.4	0.4	0.3	0.4
Gov't Monopolies	1.2	1.2	1.1	1.1	0.6	1.0
Gov't Enterprises	0.4	0.3	0.3	0.3	0.2	0.3
Other	0.5	0.4	0.3	0.3	0.2	0.3
Total	12.3	12.1	11.1	11.8	10.1	11.3

Table 3.7--Effective Tax Rates Based on Adjusted Income by Income Classes, 1969 (Percentages)

Type of Taxes	Income Classes (Baht)							
	Under 3,000	3,000-5,999	6,000-8,999	9,000-11,999	12,000-14,999	15,000-17,999	18,000- and over	All Classes
Individual Income Tax	--	--	--	--	0.1	0.3	1.5	0.8
Corporate Income Tax	0.5	0.5	0.6	0.6	0.7	0.7	0.6	0.6
Business Taxes	2.3	2.1	2.4	2.7	3.0	2.9	2.3	2.4
Selective Sales Taxes	1.7	1.6	1.9	2.0	2.3	2.3	1.5	1.7
Import Duties	3.5	3.3	3.9	4.2	4.8	4.5	3.3	3.6
Rice Premiums	0.8	1.0	1.1	1.1	1.1	1.1	0.7	0.9
Other Export Taxes	0.3	0.5	0.5	0.4	0.3	0.3	0.2	0.3
Taxes on Property	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Royalties and Permits	0.3	0.3	0.3	0.3	0.4	0.3	0.7	0.5
Gov't Sales and Services	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2
Gov't Monopolies	0.4	0.4	0.4	0.5	0.6	0.6	0.4	0.4
Gov't Enterprises	0.7	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Other	2.0	1.1	0.8	0.7	0.7	0.6	0.3	0.7
Total	13.0	11.5	12.7	13.5	15.1	14.6	12.3	12.7

Let us first consider the effective rates based on money income. On the average, the 1969 tax collections appeared to have imposed heavier burdens on families as a whole than was the case in 1963 (28.7 percent compared with 25.5 percent). On a class by class basis, the tax incidence of both years shows a generally regressive trend from the lowest to the highest income bracket. In 1963, the lowest income group contributed 42.7 percent of its money income to the government in tax payments, whereas the highest group contributed only 20.8 percent of its money income. The corresponding figures in 1969 were 47.0 percent and 25.7 percent for the lowest and highest income classes, respectively. The trend of effective tax rate is distinctly regressive for the first few income groups, but this tapers off in the higher income brackets. In any case, the top income group bore the least tax burden relative to its income position in both years.

When effective tax rates were computed using adjusted income as the denominator, the incidence picture changed markedly. The generally regressive trend which characterized the effective tax rates based on money income is now absent. Instead, the new effective tax rates for both years show a mildly fluctuating trend which can at best be described as proportional. In 1963 the average effective tax rate for all income classes was 11.3 percent; in 1969, the same rate was 12.7 percent. In both years, the lowest income bracket

still bore a higher tax burden than the national average and the highest income bracket lower. In 1963 households in the lowest income bracket seem to have suffered the most from taxation relative to households in other income positions, which was also true for 1969. But since the effective tax rates varied only about 2 percentage points among income classes, it is perhaps appropriate to call the tax system proportional in both years.

The pattern of the effective rates also can be depicted graphically, as shown in Figures 3.1 and 3.2. Here, a line which connects all the points corresponding to the effective rates of each income level roughly indicates the progressive or regressive nature of the tax system. A line that generally slopes downward would indicate a regressive incidence pattern, and one which generally slopes upward a progressive pattern. For a proportional incidence pattern, the line would be somewhat parallel to the horizontal axis. As can be seen in Figures 3.1 and 3.2, the tax incidence patterns in 1963 and 1969 were almost identical; they were shown to be mildly to moderately regressive across the income range under a money income base, and somewhat proportional under an adjusted income base.

It is possible, in fact instructive, to show the trend of the tax programs in 1963 and 1969 by regressing the effective tax rates upon the average money income of a representative household in each income class. The slope of the

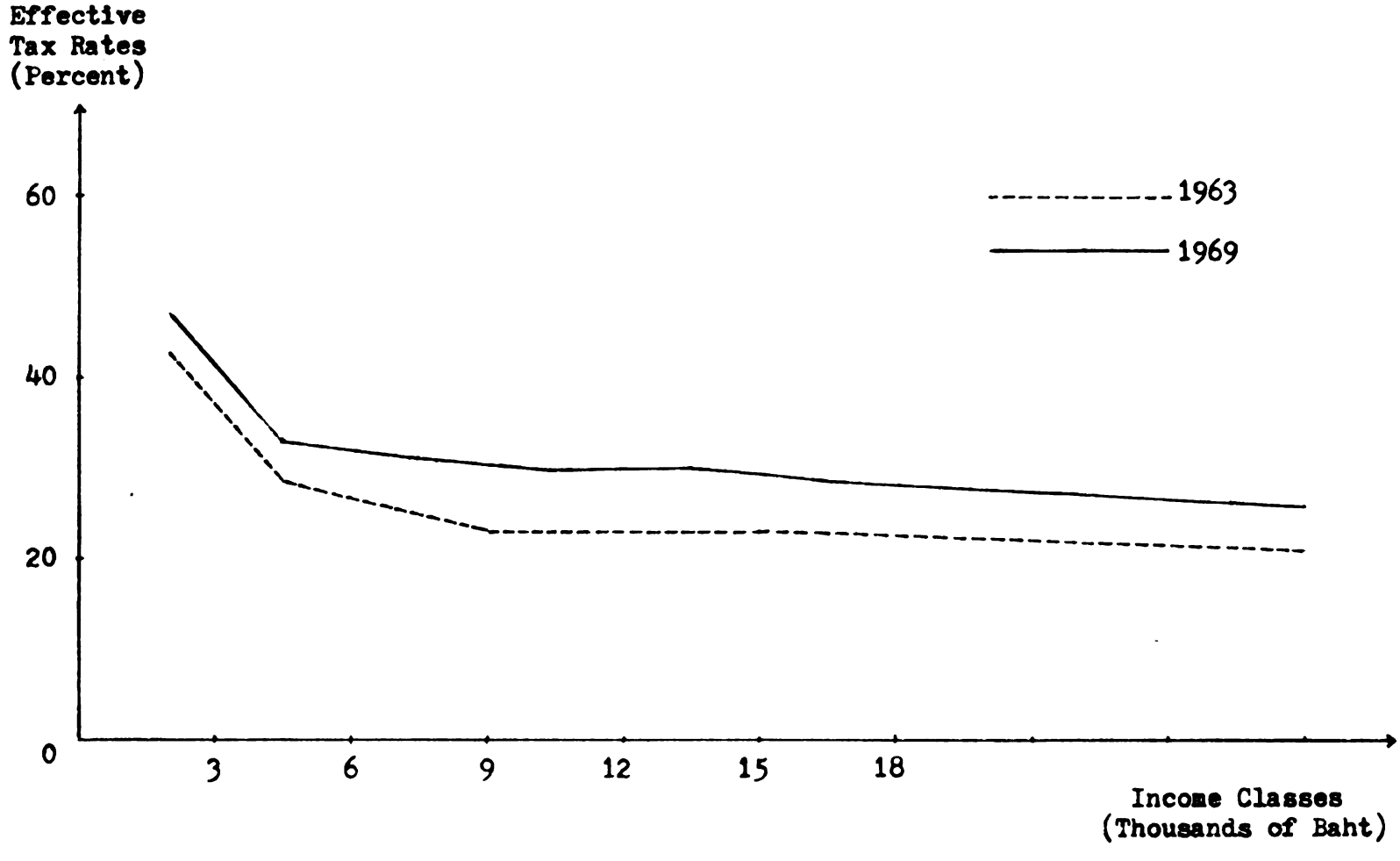

Figure 3.1--Effective Tax Rates Based on Money Income, by Income Classes, 1963 and 1969

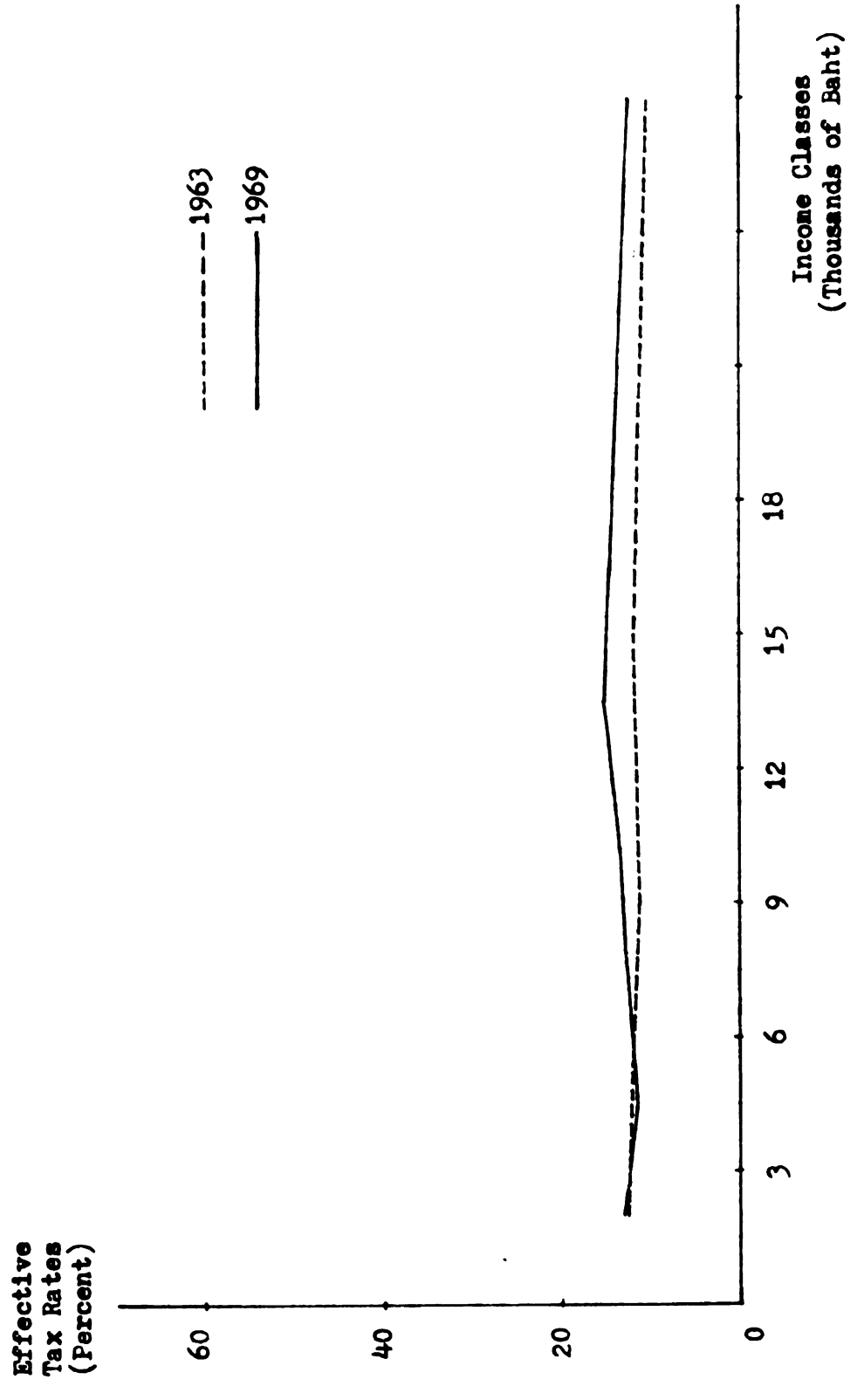

Figure 3.2--Effective Tax Rates Based on Adjusted Income, by Income Classes, 1963 and 1969

tax incidence regression curve is useful in indicating the regressivity or progressivity of the tax system: a negative slope would mean a regressive tax system, a positive slope a progressive tax system, and a zero slope a proportional tax system. After fitting the curve, it is shown in Table 3.8 that, based on money income, the 1963 and 1969 tax programs were quite regressive, with the earlier slightly more regressive than the latter programs. But with adjusted income as a base, although the tax programs were still slightly regressive, the regressivity was reduced to almost zero, signifying a tendency toward proportionality in the tax systems.

As for the tax burdens by type of taxes in 1963 and 1969, most taxes were regressive throughout, with the notable exception, of course, of the personal income tax, for which the top income class and one or two classes below it bore all of the burdens and the lower income classes none. But although only a few higher income brackets bore the burden of the income tax, this burden relative to the income of the highest bracket is quite small: only 3.9 and 3.2 percent for the top income group in 1963 and 1969, respectively.

As expected, all major indirect taxes, such as business taxes, selective sales taxes, and import duties showed a pronounced regressive pattern, especially in the lower income brackets. Another tax which was particularly burdensome to the lower income groups was the rice premium,

Table 3.8--Generalized Tax Incidence Functions [(Effective Tax Rates) = a + b (Annual Average Money Income)^a]

	Intercept	Slope	R^2
(1) On Money Income Base			
1963	33.3	-.390	.9562
1969	37.1	-.375	.9638
(2) On Adjusted Income Base			
1963	12.4	-.056	.9992
1969	13.4	-.003	.9922

[a]Average Annual Money Income is in Thousands of Baht

especially in 1969. Other taxes, which did not show a clearly regressive trend, showed a U-shaped pattern where the lowest and the highest income brackets bore a higher burden than the middle income brackets. These taxes include the corporate income tax, taxes on property, royalties and fees. All other government revenues had a mildly regressive incidence pattern throughout. This is quite understandable and, indeed, to be expected, since the bulk of the nontax revenues came from such sources as tobacco and distillery monopolies and lottery operations, products which are not consumed in proportion to income.

The Effects of Tax Programs on the Distribution of Income

As the tax structures in 1963 and 1969 appear to be regressive across the whole range of money income, one can reason that income distribution after taxation would become more unequal. This is demonstrated in Table 3.9 which presents the results of the after-tax money income distribution after the absolute amount of taxes is deducted from pre-tax money income distribution.

In Table 3.9, one immediately sees that, under a money income base, the distribution of income became more unequal over the period for the lower income groups. In 1963, the lowest two income groups suffered relatively more than other groups from tax incidence, while in 1969, all but the top two income brackets experienced a deterioration

Table 3.9--Percentage Distribution of Pre-Fisc and Post-Tax Money and Adjusted Income by Income Classes, 1963 and 1969 (Percentages)

Income Classes (Baht)	Money Income Distribution				Adjusted Income Distribution			
	1963		1969		1963		1969	
	Pre-Fisc	Post-Tax	Pre-Fisc	Post-Tax	Pre-Fisc	Post-Tax	Pre-Fisc	Post-Tax
Under 3,000	13.0	10.0	3.7	2.8	19.8	19.5	6.0	6.0
3,000- 5,999	14.0	13.5	9.3	8.7	14.5	14.3	11.9	12.1
6,000- 8,999	} 26.4	} 27.3	10.6	10.3	} 24.0	} 24.0	11.6	11.6
9,000-11,999			9.2	9.1			9.0	8.9
12,000-14,999	} 13.1	} 13.5	8.1	7.9	} 11.3	} 11.3	7.1	6.9
15,000-17,999			6.8	6.8			5.9	5.7
18,000 and over	33.5	35.7	52.3	54.4	30.5	30.9	48.5	48.8
All Classes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

in their relative income positions. Under the adjusted income base, the changes in post-tax income distribution was small in both years but the top income groups is still shown to have improved its income position. The changes in the distribution of income after-tax are presented in Table 3.10 in terms of Gini concentration ratios.

Although Table 3.10 reveals nothing new, it does give concise, quantitative support to the previous conclusions that: (1) being generally regressive, Thailand's tax programs in 1963 and 1969 caused the post-tax income distribution to become more unequal in both years, but (2) the extent of increase in inequality however, was slightly less severe under the 1969 than the 1963 tax programs.

Table 3.10 may be examined in the following manner: First, using the money income base, the 1963 tax system caused a deterioration of income equality, as measured by the Gini concentration ratio, by 8.4 percent (that is, comparing post-tax to pre-fisc income distribution), whereas in 1969 the percentage of equality deterioration was 5.4 percent. If the pre-fisc and post-tax income distributions in 1963 are compared to the respective distributions in 1969, income inequality in the latter year is shown to have been reduced by 1.4 percent and 4.2 percent, respectively. This point requires further clarification. If the existing tax programs in 1963 and 1969 were replaced by income proportional taxes, the improvement of money income distribution in 1969 over

Table 3.10--Pre-Fisc and Post-Tax Gini Concentration Ratios and Percentage Changes in Income Inequality, 1963 and 1969

Year	Gini Coefficients		Percentage Decrease (-) or Increase (+) in Gini Coefficient Within the Period	Percentage Decrease (-) or Increase (+) in Gini Coefficient Between 1969 and 1963	
	Pre-Fisc Income Dist.	Post-Tax Income Dist.		Pre-Fisc Income Dist.	Post-Tax Income Dist.
(1) On Money Income Base					
1963	.5627	.6102	+8.44	} -1.37	} -4.18
1969	.5550	.5847	+5.35		
(2) On Adjusted Income Base					
1963	.4559	.4605	+1.01	} +5.77	} +4.65
1969	.4822	.4819	-0.06		

that in 1963 would have been about 1.4 percent. With the direct effects of the existing tax systems upon the income of households, however, the post-tax 1969 income distribution is improved over the same distribution in 1963 by 4.2 percent. Therefore, it could be concluded that, based on money income, the 1969 tax programs had a smaller income de-equalizing effect than the 1963 tax programs, and such an effect worsened the index of income equality by about 2.8 percentage points (that is, 4.2 minus 1.4) less than would have been the case without the present tax programs.

On the adjusted income base, however, the changes within the year were quite small. In 1963, the tax programs worsened the Gini coefficient by just over one percent. On the contrary, in 1969 the tax programs seemed to have improved the post-tax income distribution but only by less than one-tenth of one percent. This change is much too small to be given any significance; it is likely to have been caused by a statistical error. A more credible conclusion would be that the 1969 tax programs had neutral or zero effect upon the post-tax adjusted income distribution of households in Thailand. Also, as is shown in Table 3.10, the pre-fisc income distribution was about 5.8 percent more unequal in 1969 compared to 1963. The fact that the post-tax income distribution in 1969 was still 4.7 percent more unequal than the post-tax income distribution in 1963 means that the 1969 tax programs had reduced income inequality by

about 1.1 percentage points over the 1963 programs. Obviously, the equalizing effect of the 1969 programs was still much too weak to overwhelm the de-equalizing influences outside the tax sector.

In summary, the tax programs in Thailand contributed in varying degrees to the worsening of income equality within 1963 and 1969. Although over time the tax systems were less conducive to income de-equalization, they were still far from being an instrument for income redistribution from the rich to the poor.

Summary and Conclusion

This chapter has attempted to estimate the incidence of Thailand's total tax system in 1963 and 1969. First, the theoretical problems confronting a tax incidence study were discussed, and the justification for the methods used in the present study was given. The general methodology to be followed requires that the taxes and other revenues be selected, and then, based on certain shifting assumptions and allocation formulas, these taxes in absolute amounts be allocated to households by size classes of income. Next, these absolute burdens are divided by the income base of each income class, resulting in effective tax rates. These rates show the percentages of income which households are assumed to have contributed to the government in taxes. The income redistributional effects of the government tax

programs can be seen either in the pattern of these effective rates across income classes or in the change in the post-tax distribution of income.

Several general conclusions may be noted:

(1) Based on money income, Thailand's programs were generally regressive across income classes, with the highest income bracket bearing a lower burden than all other brackets.

(2) When the income base was changed from money to adjusted income, the tax incidence pattern changed from regressive to almost proportional. This was mainly because adjusted income accounted for much of the increase in the income of the lower brackets. As a result, the effective tax rates of these lower income groups were significantly reduced.

(3) Under the adjusted income base, it was clear that the government had not caused the distribution of income of households to become more unequal, but it also had not made it become significantly more equal. Nevertheless, one is inclined to suspect that the Thai tax system more likely contributed to the worsening of household income distribution rather than to its improvement, since the income of the upper income brackets was likely to be understated and that of the lower income brackets overstated on an adjusted income basis.

(4) The above results also can be demonstrated by changes in the pattern of income distribution after absolute

tax burdens are subtracted from the initial income distribution. Regarding money income, the post-tax distribution of income became more unequal for both 1963 and 1969, although the 1969 tax programs made it slightly less unequal than did the 1963 tax programs. Concerning adjusted income, the post-tax distribution of income remained practically unchanged although forces other than government tax policies caused initial income distribution to become more unequal.

(5) Finally, what is particularly disquieting about the general tax incidence picture is that the effective burdens of the highest income group still are lower than the effective burdens of the lowest income group. For this reason alone, the tax system deserves to be reevaluated.

FOOTNOTES

[1]See Richard A. Musgrave, The Theory of Public Finance (New York: McGraw-Hill, 1959), Chapter 1.

[2]Richard A. Musgrave et al., "Distribution of Tax Payments by Income Class: A Case Study for 1948" National Tax Journal, 4 (March, 1951): 1-48.

[3]It is counterfactual because it is against the fact: the government or the tax system cannot simply be assumed away. The term was first used by Eugene Smolensky and his associates. See Jean Behrens and Eugene Smolensky, "Alternative Definitions of Income Redistribution," Public Finance, 28 (1973), pp. 315-332, and Morgan Reynolds and Eugene Smolensky, "The Post-Fisc Distribution: 1961 and 1970 Compared," National Tax Journal, 27 (December, 1974), pp. 515-530.

[4]Alan R. Prest, "Statistical Calculations of Tax Burdens," Economica, 22 (August, 1955), pp. 234-45. Prest also quoted Edwin Canaan as saying that "such an inquiry (tax incidence study) is a 'will-o-the-wisp' and absolutely useless."

[5]Carl S. Shoup, Public Finance (Chicago: Aldine, 1969); Richard M. Bird and Luc De Wulf, "Taxation and Income Distribution in Latin America: A Critical Review of Empirical Studies," IMF Staff Papers, 23 (November, 1973), pp. 639-81.

[6]Richard A. Musgrave, "Estimating the Distribution of the Tax Burden," Chapter 2 in Problems of Tax Administration in Latin America: Papers and Proceedings of a Conference held in Buenos Aires, Argentina, October, 1961 (Baltimore, 1965), pp. 41-42. In fact, this differential incidence approach had already been used in the original Musgrave et al. study in 1951.

[7]Arnold C. Harberger, "The Incidence of the Corporate Income Tax," Journal of Political Economy, 70, (June, 1962), pp. 215-240.

[8]Shoup, Chapter 2.

[9]Charles E. McLure, in spite of his high praise of Harberger model as "a breakthrough in the analysis of tax incidence" in his paper," General Equilibrium Incidence Analysis: The Harberger Model after Ten Years," Discussion Paper No. 37, Rice University, Fall, 1972, used conventional partial analysis in his tax incidence studies in West Malaysia, Colombia and Panama.

[10]Alan R. Prest, "The Budget and Interpersonal Distribution," Public Finance, 23 (1968), p. 92.

[11]Shoup, p. 11.

[12]From the surveys of tourist expenditures carried out by the Tourist Organization of Thailand (TOT) (Tourist Expenditure Surveys, Bangkok: TOT, various issues), it was shown that the total expenditures by tourists in 1963 and 1969 were estimated at Baht 476.5 million and Baht 1406.3 million respectively. These were by no means small amounts, but it was impossible to know how much of these expenditures went to the government as taxes. The use of some nominal tax rates to compute the amount of taxes that were supposed to be paid by these tourists was hazardous; and considering the existing laxity in tax compliance and tax enforcement, the resultant tax figures were likely to overstate the actual taxes paid. In all, it was not unreasonable to assume that these taxes were small or would not greatly affect the total incidence pattern.

[13]For details of these allocation formulas, see Appendix D.

[14]Musgrave, The Theory of Public Finance, pp. 232-40.

[15]Musgrave also argued that either the factor supplies could be assume fixed or that the effects of changes in relative factor prices on relative product prices could be ignored since factor proportions were likely to be very much the same for each combination of goods consumed at each different point on the income scale. In other words, the nominal burdens could be assumed to stay put. See his "Estimating the Distribution of the Tax Burden," in Income Redistribution and the Statistical Foundations of Economic Policy, eds. C. Clark and G. Struvel, (London: Bowes and Bowes, 1964), p. 201.

[16]See Marian Krzyzaniak and Richard A. Musgrave, The Shifting of the Corporate Income Tax (Baltimore: John Hopkins, 1963).

[17]For literature on this topic, see for example, Marian Krzyzaniak, ed., Effects of Corporate Income Tax (Detroit: Wayne State University, 1966); Richard S. Gordon, "The Incidence of the Corporation Income Tax in U. S. Manufacturing 1925-62," American Economic Review, 57 (September, 1967), pp. 731-58; John G. Cragg, Arnold C. Harberger and Peter Mieszkowski, "Empirical Evidence on the Incidence of the Corporation Income Tax," Journal of Political Economy, 75 (December, 1967), pp. 811-821; Peter Mieszkowski, "Tax Incidence Theory: The Effects of Taxes on the Distribution of Income," The Journal of Economic Literature, 7 (December, 1969), pp. 1103-1124; T. Mathew, "Shifting and Incidence of Corporation Income Tax: A Review," The Indian Economic Journal, 20 (October-December, 1972), pp. 257-274.

[18]Bird and DeWulf, pp. 660-661.

[19]Jay S. Salkin, "On the Direct Measurement of Tax and Progression in Thailand," National Tax Journal, 27 (June, 1974), pp. 301-18.

[20]The results of the distribution of tax burdens according to alternative shifting assumptions for corporate income tax practiced in most incidence studies will not be presented in this study because they were not substantially different from the results using full shifting assumption. This is not surprising, for the corporate tax collection was very small in Thailand contributing less than 5 percent of the total government revenues in either 1963 or 1969.

[21]Prest, "Statistical calculations . . ."

[22]Musgrave, "Estimating . . .," (1965), pp. 42-46. See also W. Irwin Gillespie, The Incidence of Taxes and Public Expenditures in the Canadian Economy (Ottawa: Queen's Printer, 1966), pp. 40-51.

[23]Allan M. Cartter, The Redistribution of Income in Postwar Britain: A Study of the Effects of the Central Government Fiscal Program in 1948-49 (New Haven: Yale University Press, 1955), pp. 19-22.

[24]Earl R. Rolph, "A Proposed Revision of Excise-Tax Theory," Journal of Political Economy, 60 (April, 1952), pp. 102-117.

[25]See mainly Sriprinya Ramakomud, Thailand's Foreign Trade: Structure and Policy, 1951-60 (Bangkok: Kuruspha Press, 1968).

[26]The researches on the incidence of rice premiums in Thailand were quite numerous; see for example Sura Sanittanont, Thailand's Rice Export Tax: Its Effects on the Rice Economy (Bangkok: National Institute of Development Administration, 1967); Edward Van Roy, "The Pursuit of Growth and Stability Through Taxation of Agricultural Exports: Thailand's Experience" Public Finance, 23 (1968), pp. 294-317; Trent Bertrand, "Rural Taxation in Tahiland," Pacific Affairs, 42 (Summer, 1969), pp. 178-188; James C. Ingram, Economic Change in Thailand, 1850-1970, 2nd ed. (Stanford: Stanford University Press, 1971).

[27]See Wit Satyarakwit, "Tin: A Comparison of Gravel Pump and Dredging Mining," M. A. Thesis, Faculty of Economics, Thammasat University, August, 1971.

[28]Joseph Pechman and Benjamin Okner, Who Bears the Tax Burden? (Washington, D. C.: The Brookings Institution, 1974).

CHAPTER IV

THE INCIDENCE OF PUBLIC EXPENDITURES

While the previous chapter examined the revenue side of government activities and the subsequent distribution of tax burdens by size classes of income, this chapter will examine the other side of the fiscal coin: public expenditures and the distribution of their benefits by income classes of households. As mentioned in Chapter 3, one of the main purposes of collecting taxes is to enable the government to provide both general and specific goods and services to taxpayers. This process has repercussions on the income distribution of households, since each householder's tax paid is usually not matched by an equal amount of government expenditure for that household. Therefore, to account for the complete income redistributional effects of a fiscal system, it is imperative that the incidence of public expenditures be evaluated, in addition to the incidence of taxes. To omit this item would be tantamount to assuming either that the benefit incidence is neutral or that it is unimportant, neither of which view is tenable on an a priori basis.

In estimating the income redistributional impact of public expenditure programs, a researcher faces problems much more severe than those encountered in estimating tax incidence. Most difficult of all are the theoretical and operational

issues of how to quantify the expenditure "benefits" and allocate these to different income classes. The problems seem almost insurmountable when dealing with such "public goods" as national defense, public health and sanitation, public administration, and protection. Once these matters are disposed of, the rest of the procedure follows smoothly. The methodology in this study will be to establish some rules for allocating the quantified amounts of benefits to various income classes. Many of these rules are the same as those used earlier in the allocation of taxes. After all benefits are allocated to each income bracket, the effective rates of expenditure benefits or benefit incidence are then calculated by dividing such benefits by the income bases of each income bracket.

Theoretical Problems in Expenditure Incidence Studies

Broadly speaking, the theoretical questions involved in a benefit incidence study can be summed up as follows: (1) Who should be regarded as the beneficiaries of government spending: those who directly receive government money, or those who are ultimately affected by what the government does? (2) It is likely that there will be more than one group of households or one segment of the population which will receive the benefits of (or be affected by) government spending. In this case, should one be interested mainly in the primary beneficiaries, or in the secondary and subsequent beneficiaries

as well? (3) How does one quantify the benefits expected to be received by the designated groups of households in the case of certain specific expenditures, or by the population as a whole in the case of general public expenditures? (4) Is it necessary to determine the true beneficiaries? Can one discuss the benefits of government expenditures without knowing who the actual beneficiaries are? These questions will be discussed in detail below.

Money Flow Versus Benefit Approach

Two approaches may be used in analyzing the incidence of expenditure benefits: the money flow approach and the benefit approach.[1] The first would concentrate only on the actual recipients of direct payments made by the government either in exchange for goods and services or as transfers, without considering who would ultimately benefit from those services. For example, salary payments to public teachers would be considered benefits to the teachers themselves. While students obviously also would benefit from this educational expenditure, such benefits are not considered in the money flow approach. The second, or benefit, approach emphasizes the end results of public spending; of concern is the eventual beneficiary, not the recipient of any money payments. In the case of the educational expenditure mentioned above, for example, the final beneficiaries under the benefit approach would be the students and their families, not the teachers. In the case of defense spending, it is the entire population

which enjoys the benefit of protection, not the military personnel employed or the firms under contract to produce armaments.

While the money flow approach is more appropriate when dealing with governmental transfers whose recipients are believed to be the final beneficiaries, it is inadequate in nontransfer cases and in the situation where the government provides substandard or no services. Moreover, as Adler has pointed out, the money flow concept is based on an implicit assumption that the income of government employees would be zero if the government did not employ them, which of course is not always true in the real world; if the government did not employ them, they often would find work elsewhere.[2] As the foregoing indicates, it is conceptually more plausible and useful to evaluate the effects of government services in terms of the final beneficiary, not the recipient of government funds spent on a certain public project. Generally, therefore, the benefit approach is adopted in most fiscal incidence studies.

Direct and Indirect Recipients of Benefits

When the government spends its money, it must have in mind who will be the first to receive the benefits directly. If the spending is on educational services, the children attending school and their families would be the primary recipients; if the spending is on road building, the road users would be the direct recipients, and so on. This does not mean,

however, that the effects of the benefits would terminate with the primary beneficiaries. More than likely, there will be countless circumstances in which secondary or other indirect beneficiaries exist. For example, an increase in the number of students or educational activities would also boost book production and the income of teachers, and an increase in road use as a result of highway expenditure would benefit producers of transport equipment as well as the construction industry.

Closely related to the idea of indirect benefits is the concept of externalities. A well-educated population could result in the externalities of increased productivity and a more propitious climate for technical advancement. The externalities of a healthy population could be a longer and more productive life, and of an educated population, less social delinquency and a more socially responsible electorate. Recently Charles E. McLure has tried to emphasize the pecuniary aspect of externalities in his study of how relative product and factor prices are affected by the public purchase of goods and the employment of factor services. His discussion of "expenditure incidence," which involves changes in the distribution of income resulting from marginal differences in private and public spending patterns (as purchasing power is transferred from the private to the public sector), can be conceived as another example of how and why the concept of the direct or indirect benefits of externalities is important in the study of the redistributive impact of a fiscal system.[3]

The question now is whether it is possible, in practice, to estimate all tangible as well as intangible effects of government spending on direct and indirect beneficiaries. Unfortunately, given the present state of the art of a benefit incidence study, it is very difficult, if not impossible, to go beyond the direct or primary benefits of government expenditures. As will be shown later, even an assessment of primary benefits is difficult. The full effects of government spending defy theoretical estimation at this point, much less quantitative measurement. It is possible, of course, to attack the problem of total effect estimation through cost-benefit analysis, but one must be willing to accept certain simplifying assumptions and subjective judgments in dealing with the following: the scope of possible effects; how long the effects will last; the opportunity cost of a particular activity; what discount rate to use; whether all possible costs and benefits have been considered; and so on. A full-scale cost benefit study of benefit incidence, apart from the above shortcomings also would be very costly. All in all, it seems more practical to evaluate only the direct, primary benefits. In doing so, all secondary and other effects as well as all externalities must be ruled out. This is the position adopted by most benefit incidence studies.

The Measurement of Benefits

Having selected the benefit approach and determined that only direct benefits are measurable, the next problem is

how to measure the benefits from public expenditures. If these are classified into three categories, namely, transfer expenditures, specific expenditures, and general expenditures, valuation of the first category poses little or no problem. If it is assumed that the benefits accruing to transfer recipients are not shifted to others, then the value of the benefits in money terms may be considered equivalent to the amount of such transfers. It is the specific and general expenditure categories that present problems.

Specific government expenditures are expected to provide benefits to readily identifiable groups. Funds spent on education should specifically benefit students in school; those spent on highways should benefit highway users and consumers of highway-transported products; subsidies for low-cost housing should benefit poor families; and so forth. However, those goods and services are not necessarily private goods in their entirety, and thus valuation of benefits through the price mechanism and exclusion principle is not always possible. For example, not all roads charge tolls, and some educational services are free. A more manageable valuation of specific benefits is possible if one is willing to make the important assumption that the total of benefits derived from a certain expenditure program is equal to the total costs of that program. Under this assumption, the allocation of expenditure benefits is, in reality, the allocation of costs of public programs to expected primary beneficiaries. This "accounting

approach," called the cost incurred on behalf of" method by W. Irwin Gillespie and the "input approach" by G. S. Sahota[4] implies that (1) the average cost of the provision of goods and services is constant, and (2) such provision is efficient in a Pareto optimal sense: there is no overextension of activities and no waste.[5] These assumptions are required to assure that marginal cost, average cost, and marginal benefit are all equal at an efficient equilibrium.

For pure social goods provided by the government under such general expenditures as national defense, public administration, or diplomacy, the valuation problem is even more intractable because the true preferences of households are not known. A social good (or service) is consumed in equal amount by all, its enjoyment cannot be made subject to price payments, and no one can be excluded, even if he does not pay for it. Specifically, if the provision of a social good were to be financed through taxation, no one would reveal his true preference for fear that he would have to pay for the good and someone else would get a free ride. Generally, since most of these benefits accrue to all families free of charge, families do not directly indicate the value they place on each good or service. Therefore, it is impossible to determine the total amount of benefits from each expenditure that should be added to the income of families.

Although the provision of a social good could be determined through voting systems, it has been shown that there are no perfect systems.[6] In fact, the valuation of public

goods is not possible unless one assumes that the consumer's preference function, or the social welfare function, or both, exist and are known. Even Paul A. Samuelson's celebrated theory of public good does not help because it does not explain how public goods are determined or valued; it only states in a specific theoretical framework the condition under which a public good together with a private good are to be optimally or efficiently allocated.[7]

To overcome these difficulties, economists again resort to the accounting approach, where total benefits are assumed equal to total costs. As the marginal valuation of benefits of each household is still not known, certain utility functions (or allocation criteria) must be assumed. Although crude, there seems to be no better alternative, especially when empirical manageability is taken into account. As K. V. Green has said: "Given some plausible alternative models and our present state of knowledge about the demands of various groups for public services, the assumption that such benefits and costs are equal may be no worse than any other assumption."[8] De Wulf has suggested the "behavioral approach," which also uses the valuation of benefits at production cost. However, after such benefits are allocated to different subgroups of the population, a further "subjective valuation" of the presumed beneficiaries is made so as to estimate the real value of the benefits as closely as possible.[9] But, unless some theoretical or operational framework is established for this subjective valuation, the results could be so diverse as to

render the expenditure incidence study totally unreliable. Despite the many shortcomings of the accounting approach, De Wulf admits that, in the absence of knowledge about the politics of decision making, it is useful in the evaluation of publicly provided services to various subgroups of the population.[10]

Expenditure Beneficiaries and the "Spendee" Concept

The preceding section discussed how the benefits received by households from public expenditures are to be valued, a task which is unusually difficult because preference schedules are unknown. Recently a group of World Bank experts has attempted to substitute beneficiaries with the "spendee" concept, that is, households or groups within the population on whom government monies are spent. Emphasis no longer is placed on the value recipients attach to public benefits, but only on the magnitude of government spending for different activities and on whom it is helping.[11]

In a sense, this is an attractive solution to the revealed preference problem faced in expenditure incidence studies. The study now becomes more manageable and less value laden since the focus shifts to who receives how much in terms of costs and away from benefits. For a study of the distributive impact of public expenditures alone, the spendee concept alleviates many of the usual conceptual difficulties; the problem becomes one of straightforward statistical estimation. But it does not offer a solution for a full fiscal incidence

study, where emphasis is placed on how much the government has helped in the distribution of income of households through public expenditures in exchange for what has been taken away from households in taxes. In other words, if taxes are assumed to have burdens which fall upon taxpaying households, then public expenditures similarly are assumed to generate benefits in varying degrees to the same households. The change from a beneficiary to a spendee concept thus does not completely solve the main problems of benefit incidence study.[12]

Practically speaking it seems that the valuation or measurement of the benefit of public expenditures must be carried out by the total benefits equal total costs method. Once the extent of benefits (costs) is known, the next question is how to allocate these benefits to households in different income classes. For specific expenditures the beneficiary groups already have been decided upon; the remaining problem is to determine the bases upon which to distribute the benefits. Gillespie's study of the United States offers an example. The benefits of an expenditure on highways were first divided between highway users and nonusers. For nonusers, cost was allocated according to the distribution of real property value. For users, the share of such costs was further divided between cars and trucks; that allocated to trucks was distributed proportionately to "consumers of transported products," and that allocated to cars was similarly distributed to "consumers of passenger travel."[13] This is the method usually accepted in a highway benefit study.

For general expenditures, various studies have adopted one of several techniques. Benefits may be assumed to be distributed either equally among households in all income classes (per capita or per household basis); proportionately on the basis of family income; according to certain utility functions, such as the ones used by Henry Aaron and Martin McGuire, and Shlomo Maital;[14] or a combination of these bases may be used, for example, one-half distributed on a per capita basis, the other half on an income proportional basis. It must be noted that there is no definite rule specifying who the beneficiary group must be, or should be, for a certain expenditure category. Criteria vary according to the nature and extent of the given expenditure from one economic setting to another. The beneficiaries of highway expenditures in Gillespie's U. S. study, for example, might be different from those in Thailand. Also, the allocation bases may differ from country to country depending upon the availability of statistical data and other distributional information.

A General Methodology

The foregoing theoretical discussion has indicated the general direction this study on expenditure incidence in Thailand will take. The following specific methodology has been adopted:

(1) With the exception of the transfer category for which the money flow method is considered more appropriate, the benefit approach will be used for most expenditures.

(2) Only direct, or primary benefits will be considered in this study; all indirect benefits and externalities, either short or long run, are assumed constant or distributionally neutral.

(3) In general the accounting approach of benefit valuation will be used. It will be demonstrated during the course of this investigation why this technique is as acceptable as the more realistic behavioral method or cost-benefit analysis. Regarding the allocation of general expenditures, only one standard set of assumptions will be used to allocate such expenditures as defense, public administration, law enforcement and justice. For reasons to be explained later, no alternative assumptions will be used to allocate general expenditures.

(4) The beneficiary, as opposed to the spendee, concept will be used. A designated beneficiary may not always actually receive the benefits allocated to him, but it is assumed that under normal circumstances he would.

(5) The procedure for allocating expenditure benefits to different income classes follows the pattern of tax burden allocation described in Chapter 3. First, the expenditure items are selected and classified into economic functions. Second, within each expenditure category a judgment is made as to which groups of households or which income classes are to receive the benefits and whether those benefits will remain with the recipient or be shifted to others. Third, the distribution of these benefits by income classes is accomplished

using some of the allocation bases described in Chapter 3, such as the distribution of income, distribution of households, and distribution of household expenditures by income classes. In addition, a few other bases upon which to distribute these benefits will be used. Fourth, after all benefits are allocated to all income classes, the effective rates of these expenditure benefits relative to each corresponding income group will be calculated to determine whether the expenditure pattern is progressive (pro-rich) or regressive (pro-poor). The change in the pattern of income distribution after government expenditures also will be examined.[15]

Selection of Public Expenditures

Public expenditures can be classified in several ways to suit several purposes. They can be categorized as consumption (current) expenditures and capital expenditures; or exhaustive expenditures, essentially government purchases of goods and services and nonexhaustive expenditures, which cover such transfers as old-age pension and unemployment benefits. As indicated earlier, most studies classify public expenditures into specific or allocable, general or nonallocable, and transfer expenditures.

In this study, a slightly different classification will be used. The specific/general/transfer breakdown will be retained, but this does not imply that specific expenditures are always allocable as pure private goods, and that general expenditures are always nonallocable as pure social goods. It will be seen later that some of the programs in the specific

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expenditure category in Thailand are more in the nature of general than specific goods, and some of the general expenditure programs can indeed be allocated with reasonable confidence to a specific, identifiable income bracket. Basically, expenditures in Thailand will be grouped according to their functions or purposes. Six functional classifications are specified for all types of expenditures as follows:

Group 1: Economic services
- a. Agriculture
- b. Power and Fuel
- c. Industries
- d. Transportation and Communication
- e. Other Economic Services

Group 2: Educational Services
- a. Primary Education
- b. Secondary Education
- c. Higher Education
- d. Vocational Education and Other

Group 3: Health and Social Welfare Services

Group 4: General Services
- a. Defense
- b. Law Enforcement
- c. Public Administration
- d. Other General Services

Group 5: Interest Payments on Public Debt

These functional classifications conform closely with the method used by the National Statistical Office, but differ

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from the method used by the Bank of Thailand, which adds current and capital categories. This study initially intended to follow the Bank's practice, but after checking the examples of current and capital expenditures for the consistent criteria that distinguished one from the other, none were found. It seems that almost all expenditure categories under economic and educational services are listed under capital spending, and the rest under current spending. Therefore, the finer separation of expenditures into current and capital groupings did not seem to serve any useful purpose and only the functional classifications will be used here.

Once the functional classifications were decided upon, the actual amounts of expenditures for each government agency were obtained from the Report of the Receipts and Outlays of the Kingdom of Thailand, published annually by the Department of the Comptroller General. The amounts used here, however, are only that portion of expenditures which is believed to benefit Thai residents; that benefitting nonresidents is excluded. For example, portions of interest and principal payments on foreign loans are subtracted from the total payments on public debt because, as transfers, their benefits fall directly on foreign debt holders.

The total adjusted amounts for each expenditure group and subgroup are shown in Table 4.1. Expenditure groups 1, 2, and 3 can generally be described as specific expenditures, and expenditure groups 4 and 5 as general expenditures and transfers, respectively. The table also shows that the level

Table 4

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Table 4.1--Total Adjusted Public Expenditures of Thailand by Functional Categories, 1963 and 1969 (Amounts in Millions of Baht)

Functional Categories	1963		1969	
	Amount	Per-cent	Amount	Per-cent
Group 1: Economic Services	2,560.2	24.6	5,962.4	26.7
Agriculture	767.7	7.5	2,222.6	9.9
Power and Fuel	271.8	2.6	286.1	1.3
Industries	179.3	1.7	173.1	0.8
Transportation and Communication	1,079.3	10.4	2,959.8	13.2
Other Economic Services	253.1	2.4	320.8	1.4
Group 2: Educational Services	1,777.5	17.0	3,674.3	16.4
Primary	1,024.7	9.8	1,997.9	8.9
Secondary	234.9	2.3	405.0	1.8
Higher	193.8	1.9	559.6	2.5
Vocational and Other Education	324.0	3.1	711.8	3.2
Group 3: Health and Social Welfare	929.3	8.9	2,338.1	10.5
Group 4: General Services	4,022.1	38.6	9,136.2	40.9
Defense	1,637.6	15.7	3,718.9	16.6
Law Enforcement	797.9	7.7	1,558.4	7.0
Public Administration	1,414.6	13.6	3,063.8	13.7
Other General Services	172.1	1.7	795.1	3.6
Group 5: Payments on Public Debt	1,139.4	10.9	1,245.5	5.6
Total	10,428.5	100.0	22,356.5	100.0

Sources: Thailand, Department of Comptroller, Report of the Receipts Incomes and Outlays of the Kingdom of Thailand, 1963 and 1969 issues (Bangkok, 1965 and 1971); National Statistical Office, Statistical Yearbook of Thailand.

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of public spending increased by more than 100 percent from 1963 to 1969. Increased spending was most pronounced in agriculture, transportation and communication, and defense. Lesser but still substantial increased expenditures were made in health and welfare, higher education, and miscellaneous general services. On the whole, educational services suffered some reduction, and the public debt services were reduced, while other services experienced some gains.

Allocation of Public Expenditures

Once the absolute amounts of expenditures are known, the next step is to allocate them to households by various classes. Each expenditure subgroup will be discussed as to who the direct beneficiaries are and on what basis these expected benefits should be allocated.

Group 1: Economic Services

Expenditures for economic services include funds spent on agriculture, power and fuel, industries, transportation and communication, and others.

Agriculture

Expenditures on agriculture ranked second after transportation and communication in both 1963 and 1969. Approximately 70 percent of total agricultural monies in both years were spent on irrigation projects, while the remainder was allocated to the Ministry of Agriculture and its various departments, such as Rice, Forestry, Livestock, Fishery, and

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Agricultural Extension. Since it is assumed that the farming sector benefits directly from these expenditures, 50 percent is allocated equally to each rural household and 50 percent is allocated in direct proportion to the share of each income bracket in the rural family income.

Allocating the benefits from irrigation creates some problems. Outlays on the construction of dams, reservoirs, and canals are capital spending which is expected to yield benefits in future years. The normal allocation method, that of equating the costs of capital expenditures in any one year with their benefits in the same year, which is the method to be adopted here, appears to violate common sense. For example, in the year when construction of a dam is underway, costs are being incurred, but the dam would not yield any benefit until completion, perhaps two or three years later. Therefore, it would seem unreasonable to match costs with benefits in the same year. However, one could argue that it is possible to impute the benefits for that year by discounting the stream of future benefits to the year in question, which could very well equal the costs of construction in that year.

A more acceptable way of imputing the probable benefits from such investment expenditures as irrigation and other water resource development is through cost-benefit analysis. The use of this method in the case of water resources projects is perhaps the most established practice in all areas

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of development program evaluation.[16] Virtually all irrigational projects in Thailand use cost-benefit techniques in preparing feasibility reports for external borrowing. The method is universally used and is fashioned after its successful application by the United States Bureau of Reclamation. In Thailand, three kinds of benefits, direct, indirect and public, are normally evaluated in an irrigation project. Direct benefits from a new dam or reservoir include increases in farm property or farm income, investment in farms, and government revenues from land taxes and taxes on farm products, such as rice premiums. Indirect benefits incorporate sales of farm produce for local and nonlocal processing, and farm purchases for family living and production expenses. Finally, public benefits involve, for example, settlement, employment, and investment opportunities in the area, increases in community living facilities and services, and a stabilization effect on the economy. After summing all the benefits over the expected life of the project (normally 25 to 30 years), the total is compared to the cost of the project, both direct and indirect. The resulting ratio usually is high enough to erase any doubt about the project's profitability. To give only two examples: the total benefit-cost ratio of the Kang Krachan Project (Rathburi Province in the Central Plain) was estimated at 13.3 to 1, and the direct benefit-cost ratio of the Lam Ta Kong Storage Dam Project, in the northeastern province of Korat, was estimated at 9.1 to 1.[17]

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It would appear more accurate to use the benefit-cost results from these feasibility reports as a basis for evaluation in this study. But, as the actual results of most irrigation projects have indicated, the benefit computed in the feasibility reports tends to overstate reality. The expected benefits are computed generally on the assumption that technical and institutional factors will not create any problems in the actual construction of the project and in its functioning once completed. Experience has proved, however, that many irrigation projects suffer serious technical problems, among them a water level that is too low for distribution, unfinished or too shallow distributing canals, and poor construction due to the use of low-grade materials. On the institutional side, an inadequate control of most operations leads to large-scale corruption, causing tremendous waste and long delays. Moreover, many farmers fail to grow a second crop in the dry season, even when the water is available, and many do not exercise sufficient care in maintaining the distributing canals in good working order. All these problems call into serious question the accuracy of benefit-cost ratios estimated on the order of nine or ten or more to one. One expert in agricultural development in Thailand has commented: "The benefits from the uses of the present irrigation systems are much lower than expected when compared to the costs involved; the efficiency of investment is far below what it should be."[18]

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The purpose of the foregoing has been to show that the valuation by existing cost-benefit analysis in a developing country such as Thailand is by no means superior to other more qualitative approaches. The irrigation example demonstrates that equating total benefits to total costs in subsequent expenditure evaluation is actually quite reasonable. Since it can be conceived that some projects generate somewhat more benefits than costs, while others generate less, the total benefits, overall, may reasonably be assumed to be equal to total costs.

For the allocation of benefits from irrigation expenditures to various income groups, 70 percent is allocated to farmers according to their share in the distribution of rural family income. The reasoning for this is that the bigger the land holding and hence the higher the income position, the larger the benefits derived from water services. The remaining 30 percent is allocated to merchants, middlemen, transport operators, exporting companies, and all those who are associated with the process of transferring farm products from farm to market.[19] As these groups are likely to reside in urban areas, the benefits are assumed to fall on urban households according to their shares in the distribution of urban family income. The same allocation rules are used for 1969 and 1963.

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Power and Fuel, and Industries

The subcategories of power and fuel and industries are small in comparison to the others. Most power and fuel expenditures are allocated to government bodies associated with electricity generation, namely, the National Power Commission, the Provincial Electricity Authority, the Lignite Authority, the Metropolitan Electricity Authority, and two of the government-operated oil refineries. That portion of expenditures which clearly helps provide electricity for rural households, such as funds spent by the Provincial Electricity Authority, is assumed to benefit rural households according to the pattern of their income distribution. Since most electric power expenditures aid urban more than rural households (most of the latter still do not have electricity service), the remaining benefits are distributed to households partly in proportion to their shares in the total income and the urban income.

The benefits of refinery expenditures are distributed to households according to the patterns of expenditures on transport services, household operations, and total expenditures.

Most industrial expenditures are allocated to the Ministry of Industries, some of its subsidiary departments, and a few state enterprises. The allocation of benefits from ministry services is quite difficult because there is no clear-cut basis for judgment. The rule adopted here is to allocate

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approximately one-half the expenditures on a per household basis and the other half in proportion to income. Expenditures allocated for government enterprises are assumed to benefit households according to the patterns of their expenditures on the products of such enterprises, whether these be food, clothing, household goods, or others.

Transportation and Communication

Transportation and communication expenditures are the largest in the Expenditure Group 1. As expected, they consist of budgetary allocations to the Ministry of Communication and its various departments. The services of the ministry are assumed to benefit every household equally, while those of the Civil Aviation Department (in 1969 only) are assumed to benefit only the top income class.[20] Of the Post and Telegraph Department spending, 25 percent is believed to have benefited only the top income class, as this figure is roughly the portion of outlays on international postal and telecommunication systems. Another 25 percent is distributed on an income proportional basis, and the remaining 50 percent on a per household basis. Expenditures of the Port Authority, dealing mainly with overseas shipping, and of the Department of Harbour, dealing mainly with domestic water transport, are distributed proportionately according to household income shares and the patterns of household transport expenditures respectively. The services of the state railways are divided into passenger and trunk categories. Since about 53 percent of earnings in both

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1963 and 1969 came from passenger services, and 47 percent from trunk services,[21] 53 percent of the benefits are distributed to households on the household transport expenditure pattern basis and 47 percent on the total expenditure pattern basis.

The expenditures of the Department of Highways and the Department of Land Transport have specifically been set aside for discussion here so that special attention may be given to them. They constituted the single largest budgetary allocation of all other governmental departments in Thailand in 1969 and the second largest in 1963, obviously indicating that great emphasis was placed on highway construction in both years. It is necessary, therefore, that any benefit allocation be based on a careful study of the highway situation.

Similar to expenditures on irrigation projects, funds for highway construction are investment expenditures, the benefits of which in any given year are difficult to measure. However, using more or less the same methodology employed in dealing with agricultural expenditures, it is assumed that the benefits of highway spending in 1963 and 1969 are equal to its costs in the same period. This is not a major problem; more difficult is the distribution of these benefits among households of different income brackets.

In his studies on highway expenditures in the United States and Canada, Gillespie assumes that expenditures are incurred on behalf of both users and nonusers of highways.[22] Users are defined mainly as those who own and operate automobiles

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and those who consume transported commodities, whereas nonusers are those who benefit from the access facilities to their property and whose property increases in value as a result of nearby roads.

Gillespie uses three methods to divide costs between users and nonusers and the cost share between passenger cars and trucks. For the former, he employs the relative use approach: the distance traveled by vehicles on through traffic roads and local or access roads is compared through road surveys. The percentage share of through traffic road travel indicates the portion of highway expenditures that benefits highway users, and the percentage share of local and access road travel the portion that benefits nonusers.

Another method for separating user from nonuser benefits is the net earning credit approach. It is assumed that the frequency of use of primary and local roads in relation to their respective construction costs determines the benefits accruing to road users and nonusers. Although the costs of construction and maintenance of through traffic roads are much higher than for access roads, the cost per vehicle mile travelled is usually much lower for primary than for secondary roads. Compared to the relative use method, the earning credit method tends to yield higher benefits for nonusers. However, the results of U. S. road studies, as cited by Gillespie, have shown that both methods give remarkably similar results.

For the division between the benefits to cars and trucks, Gillespie uses the incremental cost method. This divides the

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cost of road construction into "basic" and "specific" costs, the former being those necessary to provide a road for light vehicles, the latter being additional costs necessary to provide a road for successively heavier vehicles. For example, imagine a road with a one-foot thick surface for use by both cars and trucks. It could be established that light cars require only a four-inch surface; the additional eight inches are needed for the heavier trucks. The cost of the first four inches would therefore be spread over all vehicles, and the costs of the next eight inches over trucks of varying sizes.

This brief summary indicates how the problem of highway benefits is dealt with in systems such as those in the United States and Canada, but unfortunately, all these methods have little applicability in Thailand. There, the road system is much less developed, the separation between road users and nonusers is not practicable, and, most important there is no study in Thailand comparable to the one used by Gillespie to allocate benefits to private cars and trucks. An entirely new approach must be adopted which eliminates the user/nonuser dichotomy and concentrates mainly on the assumption that all households derive varying benefits from public highway expenditures.

In Thailand it is possible to classify the number of road using vehicles into three main types: passenger cars, buses and taxies, and trucks. The proportion of each type to the total number of vehicles is assumed to be the same in 1963 and 1969, that is, 60 percent trucks, 25 percent buses and taxies, and 15 percent private passenger cars.[23] It is then assumed that 15 percent of total highway expenditures in

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1963 and 1969 are incurred on behalf of households in the top income bracket, since only this group can afford to own passenger cars. Twenty-five percent of highway spending is allocated to all households according to the pattern of their expenditures on transport services (those using buses and taxies).

The remaining 60 percent is allocated to consumers of truck transported products. Information concerning goods that are transported by trucks nationwide is available only beginning in 1966, the first year a preliminary survey on the volume of road transport in Thailand was conducted by the Department of Land Transport. These national surveys, conducted each year since 1969, check all vehicles except passenger cars that pass through a number of randomly selected checkpoints during the two annual week-long survey periods. Data are gathered on points of departure, destination, and, for trucks, the commodity content of their hauls.

It is this last information that is of interest here. The classification of transported commodities differs from that of commodity groups used in the 1962-1963 and 1968-1969 household expenditure surveys, but it is possible to rearrange the former classification to coincide with the latter. For example, rice, maize, vegetables, groceries, meat, fish, and other such products, which are classified separately in the road transport surveys, can be grouped under the category of food. Similarly, weaving materials can be grouped in the clothing category, and construction materials can be partly

assigned to the household operations group and partly to the transport and total expenditures categories. The next step is to determine the share of each commodity in the total transported volume so that the portion of highway expenditures allocated to trucked transport may be similarly allocated. The best indicator as to the share of each transported commodity in total benefits is its total weight, which is equal to the number of trips multiplied by the weight of each trip. But since the incremental cost method does not enter into consideration in this study, the different weights of different trucks does not matter here. Instead, it is assumed that more benefits from highway expenditures should be imputed to the commodities which use the roads more often. In other words, only the number of trips or the number of trucks with different commodities passing through checkpoints will be used as a guideline for allocating highway benefits.

Table 4.2 shows the distribution of highway benefits assigned to trucked transport by allocation bases. According to the results of the above mentioned road survey, the largest percentage of commodities transported by trucks (21.7 percent) was of mixed types which could not be clearly assigned to any of the eight commodity groups. So, the benefits were allocated to households by the pattern of their total expenditures. Still, a large portion of truck-transported commodities was in the food and housing categories (20.3 and 19.1 percent respectively) of which the benefits were allocated to households according to the patterns of their expenditures on food and

Table 4.2—Distribution of Highway Benefits Assigned to Trucked Transport, by Allocation Bases, 1963[a] and 1969

Allocation Bases[b]	Percentage Share of Benefits by Each Allocation Base	Total Trucked Transport Benefits (Million Baht)	
		1963	1969
Food Expenditures	20.3	103.0	312.4
Housing Expenditures	19.1	96.9	294.1
Clothing Expenditures	1.2	6.4	19.3
Transport Expenditures	11.7	59.5	180.4
Tobacco Expenditures	3.7	18.8	56.9
Total Expenditures	21.7	110.1	334.0
Total Non-Food Expenditures	7.2	36.7	111.2
Rural Income Distribution	12.2	62.0	188.1
Income of Rubber Growers	3.0	15.0	45.6
Total	100.0	508.4[c]	1,542.1[d]

Source: Computed from the 1969 results of the volume of land transport survey conducted annually by the Department of Land Transport.

[a] Due to lack of data, the distribution of benefits in 1963 is assumed to have the same pattern as in 1969.

[b] See Appendix D for details and explanation of allocation bases.

[c,d] These figures are the total amounts of highway benefits assigned to trucked transport in 1963 and 1969, respectively.

household operations, respectively. Other major commodity groups consisted of rice and other farm products, and fuel. Based on Table 4.2, a substantial amount of highway benefits could be distributed fairly easily and objectively.

Other Economic Services

Major expenditure items assigned to the "other" economic services group include expenditures of the office of the Under-Secretary of the Ministry of National Development, the Department of Soil Development, the Department of Land Co-operatives, and the Bank for Agriculture and Agricultural Co-operatives (for 1969 only). As most of these expenditures tend to benefit the farming sector, they are allocated mainly according to the share of rural households in the rural income distribution.

Group 2: Educational Services

As a group, educational expenditures accounted for less than 20 percent of total expenditures in 1963 and 1969. Among the four subgroups--primary, secondary, higher, vocational and other--primary education received the highest share, with vocational and other education a distant second. In Thailand, primary education is compulsory for seven years (Prathom 1 to Prathom 7). Secondary education occupies the next five years of a student's life (Mor Sor 1 to Mor Sor 5). The student then may go on to college, where he normally spends four years to obtain a bachelor's degree. The above is what generally is referred to as an "academic" line of schooling. There

is also "vocational" schooling from the secondary through college levels.

Most public primary schools are administered by the Provincial Administration Organization in each province under the academic supervision of the Ministry of Education and with financial support from the Ministry of Interior. Some local municipalities also operate their own public primary schools separately. Public secondary and vocational education are generally operated and administered completely by the Ministry of Education. All universities were under the control of the Office of the Prime Minister before 1972, at which time a special Bureau of State Universities was established.

The functioning of the educational system in Thailand is not of interest here. What is of concern is to whose benefit the educational expenditures should be allocated. According to the benefit principle adopted in this study, children attending school and their parents, not the teaching profession, are the proper beneficiaries of public educational spending. In his study of educational benefits in the United States and Canada, where statistical sources usually are among the best, Gillespie was able to develop two allocation formulas: the distribution of school children under 16 years of age by parental income class, and the distribution of university students by parental income class. The first of these formulas is obviously inadequate because it includes preschool children and excludes older students still attending secondary schools. However, Gillespie pointed out that no

better allocation alternative was available.[24]

Primary Education

In Thailand statistics similar to the above do not exist. Until there is a household survey to determine the number of children in school by class of parental income, the only way to allocate the educational benefits of primary and secondary education is to make reasonable but arbitrary assumptions. Since primary education is compulsory and the government must provide schooling for every child, it would appear that primary schooling is somewhat similar to a public good, and every family benefits equally, and no family can be excluded. But to allocate actual primary education expenditures equally on a per household basis would be incorrect for two reasons: (1) expenditure per pupil is greater for schools in urban than in rural areas, and (2) households in lower income brackets often cannot afford to permit children to attend school all day, or even to attend at all, since they cannot afford books and clothing and/or the children are needed for farm work at a very early age. It is evident therefore, that the income position of households influences who receives educational benefits. With this in mind, one-half of primary education expenditures is arbitrarily allocated on a per household basis for both 1963 and 1969, and the other half in proportion to income.

Secondary Education

Relatively few Thai students who finish primary school continue on to the secondary level. In 1963, of all students attending public primary and secondary schools throughout the country, 96 percent were enrolled in primary schools and only 4 percent in secondary schools.[25] In 1969, these percentage shares remained the same.[26] The problem may lie either on the demand or the supply side, that is, either parents cannot afford to send their children to secondary schools, or secondary and higher educational facilities are lacking or inadequate, or both. It is believed, however, that the demand outweighs the supply factor. If so, then a family's income position plays a significant role in determining the educational future of children beyond the primary stage. It is assumed, then, that the benefits of secondary education expenditures should be distributed to families according to their share in the distribution of family income. Admittedly, this is not the best formula, but neither is it unreasonable nor implausible.

Higher Education

In 1968 the National Educational Council of Thailand conducted a survey of the cost of living of university students.[27] It originally was intended that at least one question would inquire about the income of the student's parents. For some unexplained reason, this question was excluded from the actual survey.

Fortunately, there is another source of information, albeit a limited one, on the income distribution of parents whose children are enrolled in universities. These data, classified into 11 income brackets, can be found in a publication of Thammasat University, General Facts About First-Year Students at Thammasat University, 1972-1973. Since no similar information exists for other institutions, the pattern described for Thammasat University is used as representative of all university students. There are strong arguments in support of this decision. First, the data for both 1972 and 1973 are quite similar (a correlation coefficient of .9907), implying that students from the same income classes entered Thammasat University in these two years. Second, Thammasat University may be considered typical of other universities; there is no apparent reason to think that the university's policy is biased in favor of or against any classes of households or students, or that any specific groups of students tend to enroll there more than at any other institution. Therefore, the average income distribution of parents of first-year Thammasat University students in 1972 and 1973 is used as the allocation formula for higher education expenditures in both 1963 and 1969.

Vocational and Other Educational Services

Most vocational education expenditures are allocated to households in the same manner as secondary school expenditures. The notable exception is expenditures by the Department of Teacher Training, which are allocated on the same basis as primary education benefits (since most prospective teachers

will be employed in primary schools). For other educational services, 50 percent of expenditures on educational administration, educational techniques, and fine arts are arbitrarily allocated to households on a per household basis, and the other 50 percent proportional to income. Expenditures on national research are allocated to all households equally.

Group 3: Health and Social Welfare Services

Expenditures in the health and social welfare category consist mainly of budgetary allocations to the Ministry of Public Health, Department of Public Welfare, Department of Public Works, Department of Community Development, Accelerated Rural Development Programs, and the Government Pension Plan. The Ministry of Public Health and its two largest departments, Health and Medicine, are responsible nationwide for the operation of most public hospitals and preventative medical measures such as vaccinations and health education. Thailand has no health insurance system, but the costs of public hospitalization and other medical services are low, and poor families often receive various treatments free of charge. The main problem, however, lies in insufficient medical facilities, especially the low number of hospitals, health clinics and doctors.

An ideal way to account for the benefits received by various households from public health expenditures would be to keep records of the income of those who come for medical services and the estimated share of the costs of such services

for each income class. Unfortunately, such data are not available, and it is necessary to make an arbitrary assumption. Since households in lower income brackets often receive free or less expensive medical services than do those in higher income brackets, it is reasonable to assume that the benefits are distributed according to the share of the reciprocal of household income. In other words, expenditures are allocated in such a way that the poorer the household, the greater the benefits received.

On the public welfare side, the Department of Public Welfare helps find jobs for the unemployed, raises orphans, cares for the elderly, gives temporary relief to households during natural disasters, and so forth. Similar to health expenses, these public welfare expenditures are allocated to families according to the distribution of the reciprocals of their income. Government pensions, also included in this expenditure category, are allocated to government employees using the distribution of civilian officials in 1963 and 1969. Oddly enough, these pensions are the only explicit public transfers in the entire range of government spending.

Services of the Department of Public Works in the area of public utility construction are assumed to benefit mainly urban households and are distributed according to the distribution of urban income. On the other hand, services of the Department of Community Development and the Office of the Accelerated Rural Development Programs benefit rural households almost exclusively. Their expenditures are thus

allocated to those households according to the share of each income class in the distribution of rural income.

In all, public expenditures in the health and social welfare category are relatively small compared to others. It is somewhat odd that, although most Thais are generally poor, the government is least active in the area of public transfers, from which poor households in need of assistance could benefit most directly.

Group 4: General Services

Expenditures in the general services group--defense, public administration, justice, and law enforcement--have been variously called general, nonallocable, and public goods expenditures. Having established that all individuals or households derive equal benefit from such expenditures, and that consumption by one person has no effect on the consumption of another, most researchers allocate benefits from these general expenditures equally to every individual or household. However, it increasingly has become necessary to question the wisdom of such a practice; what is theoretically sound may not be plausible or valid in reality.

The conventional expenditure incidence study frequently lumps all general expenditures into one group and then allocates them to individuals or households using different criteria. Since there is no definite set of guidelines, several alternative assumptions are necessary. However, if one looks closely into the disaggregated details of a general budget, it can be

seen that some of the generally conceived expenditures provide positive benefits to identifiable groups. At least they are not entirely "unallocable" as usually assumed.[28] Because few funds fall into this category, and because the majority of general expenditures may be truly general or nonallocable, a compromised approach is adopted in this study. Rather than lump all such expenditures and use alternative allocative assumptions, attempts are made to disaggregate them to the extent practicable so that a reasonable rule may be applied to each subgroup. The following section will discuss, in turn, the allocation rules of expenditures on defense, law enforcement, public administration, and other miscellaneous public activities.

Defense

Being predominantly a military-controlled country, Thailand spends a great deal on defense. The budgetary allocations to the Ministry of Defense accounted for almost 16 percent of the total budget in 1963 and almost 17 percent in 1969. Unlike expenditures by other government organizations, defense spending is shrouded in secrecy; no details are published, especially concerning a quite substantial portion set aside for "secret services." A detailed examination of defense spending is thus impossible and one must rely only on the conceptual characteristics of defense benefits.

Theoretically, national defense is often cited as a good example of a pure public good; it is purported to

protect equally the life and property of every citizen. This is a correct theoretical conclusion, but it also could be argued that the higher the income or wealth status of an individual or family the greater is his desire to protect it. In short, the wealthier a person is, the more he stands to lose in the event of invasion and conquest, and consequently the more he appreciates protection from the defense system.[29] Therefore, rather than allocate benefits from defense spending on a per capita or per household basis, one could allocate them according to the share of each individual or household in the distribution of income (or wealth if the data are available). Such is the allocation formula adopted in this study. In contrast to the conventional per capita allocation, the proportional allocation rule is gaining wide acceptability. A. C. Harberger, for example, has said:

> There are a great many government outlays for general purposes (administration, the courts, national defense) whose assignments as benefits to particular income groups is necessarily quite arbitrary. The notion that these benefits are roughly proportional to income and/or wealth, however, seems at least to be a plausible approximation.[30]

Law Enforcement

Expenditures in the law enforcement category can be divided into two subgroups, justice and police. For the justice system (Ministry of Justice, Department of Public Prosecution, and Department of Correction), it is reasoned that, as every person or household should be equally served by the due process of the law, benefits should be distributed equally

to all individuals or households. This allocation rule is rather straightforward and quite obvious.

The same cannot be said for police expenditures, which rank very high among major government outlays. It is true that the strength of police forces is proportionately much greater in urban and metropolitan than in rural areas. It is also true that special branches, such as traffic, fire, and highway police are oriented toward serving individuals or households in central cities or towns which are mainly in the higher income brackets. Consequently, it would be incorrect to assume that every household in the nation enjoys the same service from police operations. Rather, it would be more appropriate to divide the police budget in half and distribute the first half to households on a per household basis and the other half to households on an income proportional basis. This formula is used here.

Public Administration

Expenditures of government organizations which have not been classified previously are here classified as public administration expenditures. These are quite large, amounting to almost 14 percent of total expenditures in Thailand in 1963 and 1969. Two types of government organizations are included in this category: those constituting general bureaucratic administration, such as the Department of Local Government, Ministry of Finance, Department of Land, and Ministry of Economic Affairs, and those that deal with other government bodies

or the general affairs of the state, such as the Ministry of Foreign Affairs, Department of Technical and Economic Cooperation, State Service Commission, and Office of Government Audit.

Normally one would allocate public administration expenditures on an equal per capita or per household basis because they are aimed at satisfying social wants. Nevertheless, it could be argued strongly that in Thailand, where the administrative system is very centralized, the effects of general government are more likely to be felt in urban than in rural areas. It is more correct, therefore, to allocate benefits according to an arbitrary 75-25 percent rule; 75 percent of the bulk of public administration expenditures is distributed to each household equally, and the other 25 percent on an income proportional basis. A portion of these expenditures primarily benefit government officials, for example, the Government Official Assistance Fund and government scholarships. This portion is distributed to official households according to their shares in the income distribution of government officials.

Other Miscellaneous Expenditures

Some expenditures are set aside for the government's Reserve Fund, which is used during natural disasters or for augmenting certain regional development projects which unexpectedly run short of funds. Since no details are given as to how the Reserve Fund is spent, it is allocated equally among households.

Group 5: Interest Payments on the Public Debt.[31]

The long-standing controversy as to who should benefit from interest payments on the public debt has yet to be decided. There are various ways to look at the nature of public debt and the effects of its interest payments.[32]

First, in a classical setting, where full employment is assumed, interest payments can be construed as the cost or factor return incurred by the government in providing certain goods or services through loan finance. If this view is adopted, then the benefits of interest payments should be allocated to families in proportion to their consumption of debt-financed goods and services. But since government loans are not always tied to provision of specific goods and services, it is quite impossible to determine who benefits. Even when a project is known to be specifically financed by a certain loan, it still may be very difficult to estimate the proportion of goods and services consumed by families in each income class.

Second, in a less than full employment setting, the creation and liquidation of public debt is seen as a fiscal compensatory action of the government. Assuming the government could monetize the debt if it so wished, its decision not to do so could be considered the desire of the government to suppress an inflationary increase in private expenditures. In other words, interest payments can be seen as the price paid for the purchase of nonspending or illiquidity. If this view is adopted, the beneficiaries of such payments would be those

affected in one way or another by liquidity control, something very hard to pinpoint, of course. As McLure has pointed out, allocating the true benefits of buying illiquidity and reducing aggregate demand is a complex question, and the answer is far from clear.[33]

Third, interest payments on public debt can be conceived simply as transfer payments which serve to redistribute income in the course of providing loan-financed goods and services. It is reasoned that, since taxes are levied to pay for interest payments on public debt, and if the distribution of tax payments by income classes is not identical with the distribution of interest payments, there will be a redistribution of income among families. To treat these payments as transfers is also consistent with the general practice of national income accounting. If this view is adopted, then interest charges should be allocated to families that receive the payments.

Despite McLure's insistence that allocating benefits of interest payments to holders of the public debt makes no sense,[34] this approach offers the most practical way to trace the beneficiaries, and it has been adopted by most researchers on expenditure incidence.[35] For lack of a better alternative, this approach also is adopted here.

The next immediate question is: On what basis should these interest payments of the Thai government be allocated to which recipients? There are four main groups of domestic debt holders: the Bank of Thailand, Government Savings Bank, commercial banks, and other financial institutions and domestic

sectors. Of these, the commercial banks and other financial institutions combined held about 38.0 percent and 38.8 percent of the domestic debt in 1963 and 1969, respectively: the share of the Bank of Thailand was 41.4 percent and 31.4 percent, and that of the Government Savings Bank 18.5 percent and 29.5 percent.[36] A very small share was also held by the national Exchange Equalization Fund. Therefore, about 40 percent of the benefits from interest payments accrued to shareholders of commercial banks and other financial institutions, and they are likely to represent only from the top income bracket. Small savers in the lower income groups who normally save with the Government Savings Bank are quite numerous, but their share of benefits is small compared to major corporate savers. As a result, and due to a lack of information on the distribution of interest payments by income classes, one-half of interest payments on public debt for 1963 and 1969 are allocated entirely to the top income group, and the other half is allocated to all families in proportion to their share in total income.

Empirical Results of Expenditure Analysis

The procedure for estimating expenditure incidence is identical to that used in estimating tax incidence in Chapter 3. After deciding upon criteria for allocating all public expenditures disaggregated down to departmental levels, the expenditures are distributed to various income brackets based on the chosen criteria. The basic results, as shown in Tables

4.3 and 4.4, are the absolute amounts of expenditure benefits by income classes, by five main groups of expenditures and their related subgroups. As in Chapter 3, these basic results may be presented in two ways: effective expenditure rates by absolute income levels using both money income and adjusted income as bases, and the change in the pattern of income distribution as a result of public expenditures (the so-called post-benefit income distribution) and its related change in terms of Gini concentration ratios.

Before examining the empirical results, the reader must be cautioned about the nature and procedure of this expenditure incidence study. First, the estimates of absolute benefits by income classes are exactly that: estimates. The fact that they are quantitatively stated should not mislead one into thinking that they are the exact "benefits" accruing to different income classes. The beneficiaries are families on whose behalf the costs of public expenditures are incurred, and some benefit allocation criteria are quite arbitrary owing to various conceptual and statistical difficulties. Moreover, these families have only one characteristic in common, their income level; the estimates say nothing about such interfamily differences as the size of the household, age and education of heads of households, their occupations, and so on.

Second, when the average expenditure benefits per family are obtained by dividing the class benefits by the number of families in that income class, the result is the benefits of a typical or representative family only. In reality, each family

Table 4.3--Expenditure Benefits, by Types of Expenditures, by Income Classes, 1963
(Amounts in Millions of Baht)

Expenditure Categories	Income Classes (Baht)					
	Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000 and over	All Classes
Economic Services	528.8	399.1	614.4	287.1	730.8	2,560.2
Agriculture	179.8	141.7	212.0	84.3	158.9	776.7
Power and Fuel	38.8	38.9	71.0	35.3	87.8	271.8
Industries	51.0	31.1	44.0	19.7	33.5	179.3
Transportation	212.0	145.9	219.0	117.7	384.7	1,079.3
Other	47.2	41.5	68.4	30.0	65.9	253.1
Educational Services	419.2	263.6	390.8	179.0	524.9	1,777.5
Primary	313.0	178.1	235.3	96.8	201.5	1,024.7
Secondary	30.5	32.9	62.0	30.7	78.8	234.9
Higher	0.8	0.9	14.4	15.9	161.8	193.8
Vocational and Other	74.8	51.7	79.1	35.6	82.8	324.0
Health & Welfare Services	136.9	109.1	331.1	156.9	195.3	929.3
General Services	1,070.9	657.3	998.8	408.7	886.5	4,022.2
Defense	212.7	229.4	432.0	214.2	549.3	1,637.6
Law Enforcement	276.5	145.0	176.8	68.6	131.0	797.9
Public Administration	498.9	247.2	356.4	115.9	196.2	1,414.6
Other	82.8	35.7	33.6	10.0	10.0	172.1
Payments on Public Debt	74.0	79.8	150.3	74.5	760.8	1,139.4
Total	2,229.7	1,509.0	2,485.4	1,106.1	3,098.2	10,428.5

Table 4.4--Expenditure Benefits, by Types of Expenditures, by Income Classes, 1969
(Amounts in Millions of Baht)

Expenditure Categories	Income Classes (Baht)							
	Under 3,000	3,000-5,999	6,000-8,999	9,000-11,999	12,000-14,999	15,000-17,999	18,000 and over	All Classes
Economic Services	362.6	651.3	689.2	550.7	464.8	364.3	2,879.5	5,962.4
Agriculture	174.0	297.0	291.7	226.3	183.5	144.8	905.1	2,222.6
Power and Fuel	14.5	31.1	35.5	29.3	25.3	20.1	130.3	286.1
Industries	14.4	18.5	16.1	12.6	10.4	8.3	92.7	173.1
Transportation	134.5	257.4	297.6	245.4	216.3	168.6	1,640.0	2,959.8
Other	25.1	47.3	48.2	37.0	29.3	22.5	111.4	320.8
Educational Services	351.8	457.7	413.8	316.3	259.6	209.1	1,666.1	3,674.3
Primary	278.0	330.4	266.3	191.4	148.2	113.7	669.9	1,997.9
Secondary	15.1	37.5	43.1	37.4	32.2	27.4	211.7	405.0
Higher	2.3	2.6	20.8	20.8	22.9	22.9	467.2	559.6
Vocational and Other	56.3	87.2	83.6	66.7	55.6	45.0	317.3	711.8
Health & Welfare Services	266.6	177.8	241.7	295.7	264.5	240.5	851.2	2,338.1
General Services	1,075.5	1,350.7	1,181.8	916.9	720.1	554.3	3,337.1	9,136.2
Defense	139.0	344.7	395.7	343.3	300.9	251.8	1,943.5	3,718.9
Law Enforcement	244.2	277.2	215.0	150.2	113.8	85.8	472.2	1,558.4
Public Administration	506.7	542.9	444.0	343.8	250.8	179.1	796.5	3,063.8
Other	185.5	185.9	127.1	79.6	54.6	37.6	124.9	795.1
Payments on Public Debt	23.3	57.7	66.3	57.5	50.4	42.2	948.2	1,245.5
Total	2,079.8	2,695.4	2,592.7	2,137.1	1,759.3	1,410.2	9,682.1	22,356.5

within the same income bracket receives different benefits. For example, if one family has children in public schools or universities and another family has none, the benefits from educational expenditures clearly would fall on the first family at the expense of the second. Furthermore, one family may pay taxes, while another family successfully manages to evade them. These discrepancies must be assumed negligible or to cancel each other out for manageability in research.

Third, the ostensibly precise nature of the effective expenditure rates must not be overemphasized. Such rates are merely the result of mathematical division and should be taken as a general approximation of how much is added to original family income as a result of public expenditures.

Effective Expenditure Rates by Income Classes

When the total income of each income bracket is used to divide each corresponding amount of expenditure benefits, as shown in Tables 4.3 and 4.4, the effective expenditure rates are obtained. Tables 4.5 to 4.8 show these effective expenditure rates based on money and adjusted income, respectively. For all income classes, the benefits are classified by functional categories of expenditures.

As can be seen from Tables 4.3 and 4.4, the absolute amounts of expenditure benefits accruing to each income class are not very informative, apart from the noticeable fact that the top income group also receives the highest share of benefits.

Table 4.5--Effective Expenditure Rates, by Types of Expenditures, by Income Classes, Based on Money Income, 1963 (Percentages)

Expenditure Categories	Income Classes (Baht)					
	Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000 and over	All Classes
Economic Services	11.8	8.3	6.8	6.4	6.3	7.4
Agriculture	4.0	2.9	2.3	1.9	1.4	2.3
Power and Fuel	0.9	0.8	0.8	0.8	0.8	0.8
Industries	1.1	0.6	0.5	0.4	0.3	0.5
Transportation	4.7	3.0	2.4	2.6	3.3	3.1
Other	1.1	0.9	0.8	0.7	0.6	0.7
Educational Services	9.4	5.5	4.3	4.0	4.5	5.2
Primary	7.0	3.7	2.6	2.1	1.7	3.0
Secondary	0.7	0.7	0.7	0.7	0.7	0.7
Higher	-	-	0.2	0.4	1.4	0.6
Vocational and Other	1.7	1.1	0.9	0.8	0.7	0.9
Health & Welfare Services	3.1	2.3	3.6	3.5	1.7	2.7
General Services	24.6	13.6	11.0	9.1	7.7	11.7
Defense	4.8	4.8	4.8	4.8	4.8	4.8
Law Enforcement	6.8	3.0	1.9	1.5	1.1	2.3
Public Administration	11.1	5.1	3.9	2.6	1.7	4.1
Other	1.9	0.7	0.4	0.2	0.1	0.5
Payments on Public Debt	1.7	1.7	1.7	1.7	6.6	3.3
Total	49.8	31.2	27.3	24.5	26.8	30.2

Table 4.6--Effective Expenditure Rates, by Types of Expenditures, by Income Classes, Based on Adjusted Income, 1963 (Percentages)

Expenditure Categories	Income Classes (Baht)					
	Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000 and over	All Classes
Economic Services	3.4	3.5	3.3	3.2	3.1	3.3
Agriculture	1.2	1.3	1.1	1.0	0.7	1.0
Power and Fuel	0.3	0.3	0.4	0.4	0.4	0.4
Industries	0.3	0.3	0.2	0.2	0.1	0.2
Transportation	1.4	1.3	1.2	1.3	1.6	1.4
Other	0.3	0.4	0.4	0.3	0.3	0.3
Educational Services	2.7	2.3	2.1	2.0	2.2	2.3
Primary	2.0	1.6	1.3	1.1	0.8	1.3
Secondary	0.2	0.3	0.3	0.3	0.3	0.3
Higher	-	-	0.1	0.2	0.7	0.2
Vocational and Other	0.5	0.5	0.4	0.4	0.3	0.4
Health & Welfare Services	0.9	1.0	1.8	1.8	0.8	1.2
General Services	6.9	5.8	5.3	4.6	3.7	5.1
Defense	1.4	2.0	2.3	2.4	2.3	2.1
Law Enforcement	1.8	1.3	0.9	0.8	0.6	1.2
Public Administration	3.2	2.2	1.9	1.3	0.8	1.8
Other	0.5	0.3	0.2	0.1	-	0.2
Payments on Public Debt	0.5	0.7	0.8	0.8	3.2	1.5
Total	14.4	13.4	13.3	12.5	13.0	13.3

Table 4.7--Effective Expenditure Rates, by Types of Expenditures, by Income Classes, Based on Money Income, 1969 (Percentages)

Expenditure Categories	Income Classes (Baht)							
	Under 3,000	3,000-5,999	6,000-8,999	9,000-11,999	12,000-14,999	15,000-17,999	18,000 and over	All Classes
Economic Services	15.0	10.9	10.0	9.2	8.9	8.3	8.5	9.2
Agriculture	7.2	5.0	4.2	3.8	3.5	3.3	2.7	3.4
Power and Fuel	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4
Industries	0.6	0.3	0.2	0.2	0.2	0.2	0.3	0.3
Transportation	5.6	4.3	4.3	4.1	4.1	3.9	4.9	4.6
Other	1.0	0.8	0.7	0.6	0.6	0.5	0.3	0.5
Educational Services	14.5	7.6	6.0	5.3	5.0	4.8	4.9	5.7
Primary	11.5	6.5	3.9	3.2	2.8	2.6	2.0	3.1
Secondary	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Higher	-	-	0.3	0.3	0.4	0.5	1.4	0.9
Vocational and Other	2.3	1.5	1.2	1.1	1.1	1.0	0.9	1.1
Health & Welfare Services	11.0	3.0	3.5	5.0	5.1	5.5	2.5	3.6
General Services	44.5	22.6	17.3	15.4	13.7	12.9	10.0	14.1
Defense	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Law Enforcement	10.1	4.6	3.1	2.5	2.1	2.0	1.4	2.4
Public Administration	20.9	9.1	6.5	5.8	4.8	4.1	2.4	4.7
Other	7.7	3.1	1.9	1.3	1.0	1.0	0.4	1.2
Payments on Public Debt	1.0	1.0	1.0	1.0	1.0	1.0	2.8	1.9
Total	85.9	45.0	37.7	35.8	33.6	32.2	28.7	34.6

Table 4.8--Effective Expenditure Rates, by Types of Expenditures, by Income Classes, Based on Adjusted Income, 1969 (Percentages)

Expenditure Categories	Income Classes (Baht)							
	Under 3,000	3,000-5,999	6,000-8,999	9,000-11,999	12,000-14,999	15,000-17,999	18,000 and over	All Classes
Economic Services	4.1	3.8	4.1	4.2	4.5	4.3	4.1	4.1
Agriculture	2.0	1.7	1.7	1.7	1.8	1.7	1.3	1.5
Power and Fuel	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Industries	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Transportation	1.5	1.5	1.8	1.9	2.1	2.0	2.3	2.0
Other	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Educational Services	4.0	2.6	2.5	2.4	2.5	2.5	2.4	2.5
Primary	3.2	1.9	1.6	1.5	1.4	1.3	0.9	1.4
Secondary	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Higher	-	-	0.1	0.2	0.2	0.3	0.7	0.4
Vocational and Other	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.5
Health & Welfare Services	3.0	1.0	1.4	2.3	2.6	2.8	1.2	1.6
General Services	12.3	7.8	7.1	7.0	6.9	6.5	4.8	6.4
Defense	1.6	2.0	2.4	2.6	2.9	3.0	2.8	2.6
Law Enforcement	2.8	1.6	1.3	1.2	1.1	1.0	0.7	1.1
Public Administration	5.8	3.1	2.6	2.6	2.4	2.1	1.1	2.1
Other	2.1	1.1	0.8	0.6	0.5	0.4	0.2	0.6
Payments on Public Debt	0.3	0.3	0.4	0.4	0.5	0.5	1.3	0.9
Total	23.7	15.5	15.4	16.4	17.0	16.5	13.7	15.4

When expressed in terms of effective rates, the impact of public expenditures upon the income distribution of households in 1963 and 1969 becomes clearer. Using money income as the base, the lowest income bracket clearly received the highest share of benefits from public expenditures in both years. The effective expenditure rates for the lowest income group were 49.8 percent and 85.9 percent in 1963 and 1969, respectively, compared to rates of 26.8 percent and 28.7 percent for the highest income group in the same years.

The effective rates were much higher in 1969 than in 1963, meaning, in part, that the benefits accruing to the lowest income group were much greater in 1969 than in 1963. This pattern also applies to the top income class. As a matter of fact, the effective expenditure rates across the entire income range improved in 1969 over 1963, meaning essentially that during these six years the expenditure benefits for all income groups increased faster than their money income, and all classes received relatively higher gains from public spending in 1969 than in 1963.

When the effective expenditure rates are computed using adjusted income as the base, the results are understandably lower than the rates based on money income. The change, of course, reflects the pattern of adjusted income distribution vis-à-vis money income distribution in that the effective rates of the lower income groups, particularly the two lowest ones, are now only slightly larger than those of the higher income groups. As indicated in Chapter 2, this is because, in the

adjusted income as compared to the money income distribution, the income positions of the lower brackets increase relatively more than those of the higher brackets. This change seems to have "flattened out" the distribution of effective expenditure rates across income classes from the lowest to the highest. The effective expenditure rates from the bottom income bracket is now shown to have been 14.4 percent and 23.7 percent in 1963 and 1969 respectively, whereas the corresponding effective rates for the top income bracket are 28.7 percent and 13.0 percent.

The distribution of effective expenditure rates by income classes in 1963 and 1969 using both money income and adjusted income as bases can be depicted graphically. This is shown in Figures 4.1 and 4.2. It can be seen that, on a money income base, the income distributional effects of public expenditures were generally regressive or pro-poor in both years (and more so in 1969, as noted above). But the degree of regressivity falls off rapidly after the first income bracket and remains only slightly regressive for the rest of the income classes. The exception is 1963, when the effective rates turn slightly progressive at the highest income bracket. On an adjusted income base, the pattern of effective rates seems to have levelled off considerably, as noted earlier. The general pattern could not now be called clearly regressive, because there is some fluctuation in the middle income range in both years.

Similar to the treatment on the tax side, if one regresses these effective expenditure rates on their respective

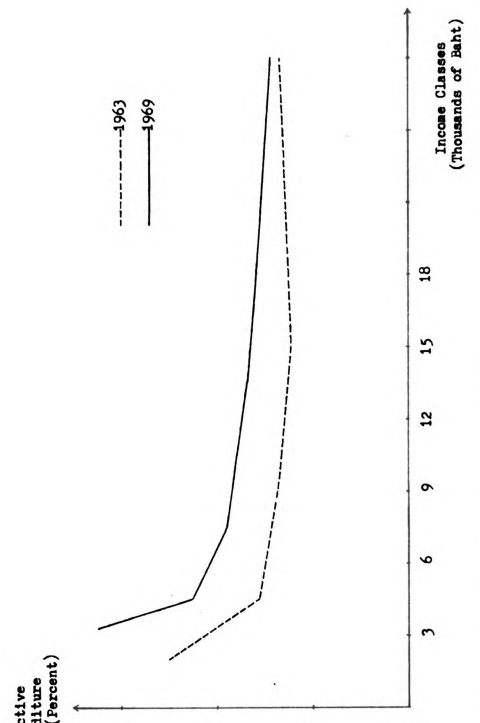

Figure 4.1--Effective Expenditure Rates Based on Money Income, by Income Classes, 1963 and 1969

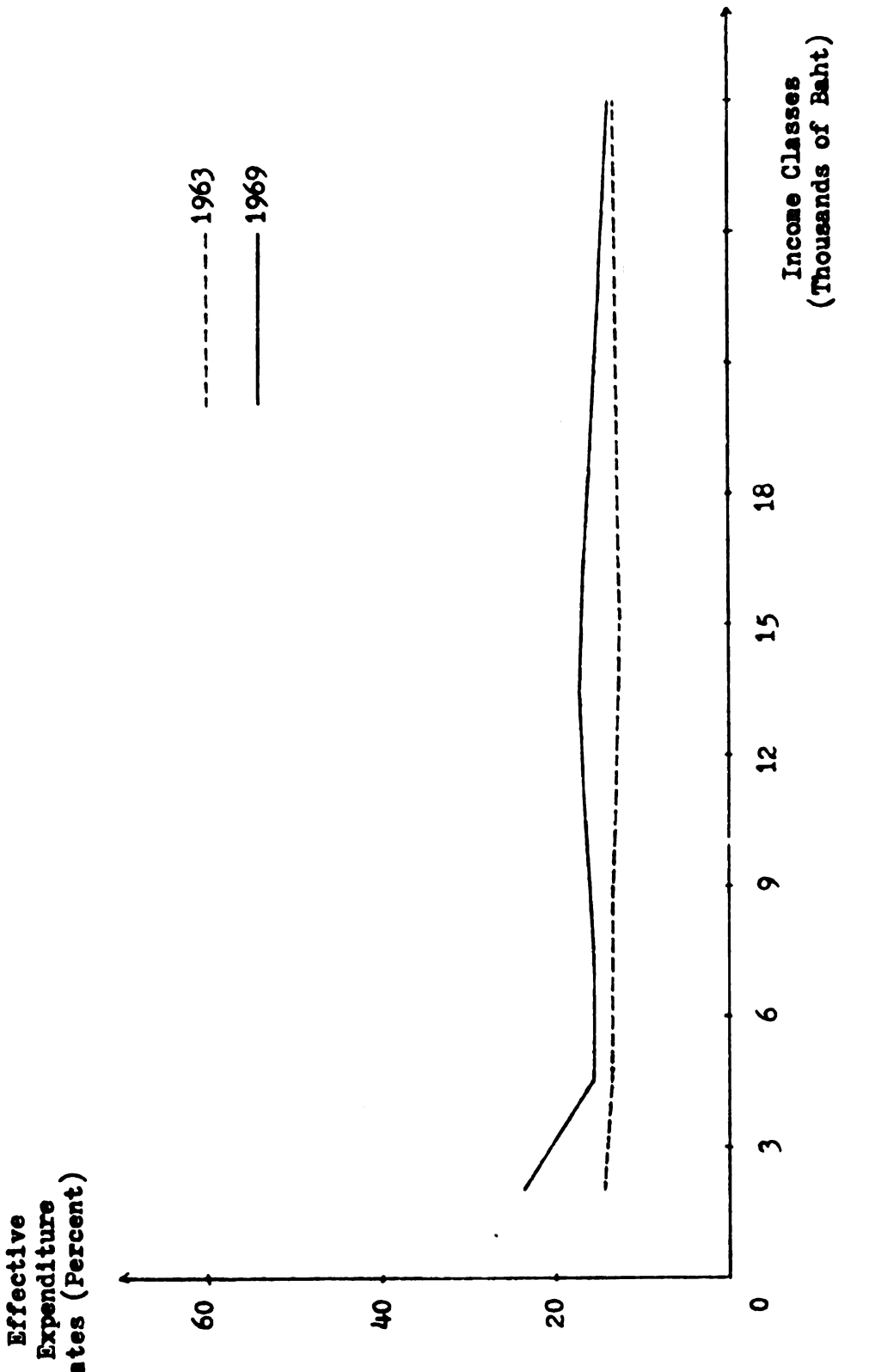

Figure 4.2--Effective Expenditure Rates Based on Adjusted Income, by Income Classes, 1963 and 1969

average annual income levels using the ordinary least-square method, the resulting slope of the regression curve could be used to roughly indicate the degree of regressivity of the expenditure system.

As shown in Table 4.9, the slopes of the regression curves that indicated the pattern of the 1963 effective expenditure rates based on money and adjusted income are estimated at -.369 and -.026, respectively. For 1969, the corresponding slopes are -.935 and -.076. This generally confirms the conclusion that on a money income base the expenditure rate pattern is slightly regressive, but on an adjusted income base it is barely regressive, so that for all practical purposes it may be regarded as proportional (particularly for 1963).

The detail of effective expenditure rates by type of expenditures also may be found in Tables 4.5 to 4.8. On the average, across income classes, in 1963 and 1969, the effective rates of expenditures on general services were highest followed in second and third places by expenditures on economic and educational services. In 1963 the average effective rate for public debt services was higher than that of health and welfare services, but in 1969 the situation was reversed. Among budgetary allocations for general services, defense always generated the highest average rate of benefits to households. General public administration, primary education, and transportation and communication were among the major expenditure sub-categories that generated high average effective expenditure rates. Effective rates of expenditures

Table 4.9--Generalized Expenditure Incidence Functions [(Effective Expenditure Rates) = a + b (Annual Average Money Income)[a]]

	Intercept	Slope	R^2
(1) On Money Income Base			
1963	37.0	-.369	.9546
1969	54.9	-.935	.8982
(2) On Adjusted Income Base			
1963	13.7	-.026	.9983
1969	19.0	-.076	.9809

[a]Average Annual Money Income is in Thousands of Baht

that were presumed to benefit poor households relatively more than the rich, such as agriculture and health and welfare services, even taken together, were quite small, accounting for only 4 percent of household money income in 1963 and 7 percent in 1969. Obviously, the lower income brackets gained when the two types of expenditures increased in 1969 compared to 1963--notably in agricultural and irrigation spending--but the increase was still quite small on the whole. A fairly high rise in benefit rates also came from spending on general services, namely, defense and public administration.

Comparing the effective rate of each type of expenditure among income classes, the lowest bracket generally received relatively higher expenditure benefits than any other except on such items as higher education and debt payments. In these two expenditures, the top bracket was the greatest beneficiary. That the total effective expenditure rate for the lowest income group based on money income was very high must be noted carefully. The bulk of these benefits (about 50 percent) was generated by such expenditures as defense, law enforcement and public administration spending. It may be argued that from the point of view of the poorest household these benefits might be ranked lower in utility than the same amount of benefits from such expenditures as agricultural, educational, health and welfare spending. However, this point is value-loaded and, as such, should be left to the judgment and evaluation of each individual.

The Effects of Expenditure Programs on the Distribution of Income

The previous section dealt with the usual way in which the income distributional effects of public expenditure programs may be demonstrated by effective expenditure rates by income classes. This section discusses the effects of public expenditure programs upon the pattern of income distribution. In other words, the focus is directed to the change in the pattern of household income distribution after expenditure benefits are computed and assigned to each income class. Once the absolute amounts of estimated benefits are added to the income of each corresponding income bracket, a new distribution should emerge. Table 4.10 shows these new distributions based on money and adjusted income concepts.

Inspecting Table 4.10, one notes the small degree of income redistribution as a result of public expenditure programs. On the money income base, the degree of redistribution is quite apparent, particularly in the lowest and highest brackets, but on the adjusted income base, the pre-fisc and the post-benefit income distributions are shown to be almost identical in 1963 and 1969. In other words, the expenditure programs of the Thai Government in 1963 and 1969, considered alone, effected very little change in the pre-fisc distribution of household income. This conclusion is supported by the change in the Gini concentration ratios.

As shown in Table 4.11, within each individual year there is an improvement in income equality as indicated by the

Table 4.10--Percentage Distribution of Pre-Fisc and Post-Benefit Money and Adjusted Income by Income Classes, 1963 and 1969

Income Classes (Baht)	Money Income Distribution				Adjusted Income Distribution			
	1963		1969		1963		1969	
	Pre-Fisc	Post-Benefit	Pre-Fisc	Post-Benefit	Pre-Fisc	Post-Benefit	Pre-Fisc	Post-Benefit
Under 3,000	13.0	14.9	3.7	5.2	19.8	19.9	6.0	6.5
3,000- 5,999	14.0	14.1	9.3	10.0	14.5	14.5	11.9	11.9
6,000- 8,999	} 26.4	} 25.8	10.6	10.9	} 24.0	} 24.0	11.6	11.6
9,000-11,999			9.2	9.3			9.0	9.0
12,000-14,999	} 13.1	} 12.5	8.1	8.0	} 11.3	} 11.2	7.1	7.2
15,000-17,999			6.8	6.6			5.9	5.9
18,000 and over	33.5	32.7	52.3	50.0	30.5	30.4	48.5	47.8
All Classes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4.11--Pre-Fisc and Post-Benefit Gini Concentration Ratios and Percentage Changes in Income Inequality, 1963 and 1969

Year	Gini Coefficients		Percentage Decrease (-) or Increase (+) in Gini Coefficient Within the Year	Percentage Decrease (-) or Increase (+) in Gini Coefficient Between 1969 and 1963	
	Pre-Fisc Income Distribution	Post-Benefit Income Distribution		Pre-Fisc Income Distribution	Post-Benefit Income Distribution
1. On Money Income Base					
1963	.5627	.5304	-5.74	} -1.37	} -2.88
1969	.5550	.5151	-7.19		
2. On Adjusted Income Base					
1963	.4559	.4529	-0.66	} +5.77	} +4.61
1969	.4822	.4738	-1.74		

reduction in Gini concentration ratios from the pre-fisc income distribution to the post-benefit income distribution. In 1963 there was an improvement of 5.7 percent in income equality (or a 5.7 percent reduction in income inequality) when the post-benefit income distribution was compared to the pre-fisc income distribution based on household money income. The comparable improvement in 1969 was 7.2 percent. As expected, the percentage improvement is greater with distribution based on money than on adjusted income. Although when each individual year is viewed, the 1969 expenditure programs are shown to have more income redistributive power than the 1963 programs. The effect is not sufficiently powerful or redistributive to offset the extraneous factors that caused the deterioration of the adjusted income distribution from 1963 to 1969. This is evidenced by the fact that the 1969 post-benefit income distribution was about 4.6 percent more unequal than the 1963 post-benefit income distribution. As this is still smaller than 5.8 percent, which is the rate by which the pre-fisc income distribution had worsened from 1963 to 1969, one could conclude that, on an adjusted income base, government expenditures reduced income inequality by 1.2 percentage points from 1963 to 1969, which is not a large amount.

Summary and Conclusion

The statistical estimation of public expenditure benefits or expenditure incidence--the subject of this chapter--is the obverse side of a fiscal incidence study, the reverse

being the tax incidence estimate. The chapter began with a discussion of the framework in which the study is to be carried out: the definition of a benefit, the identification of beneficiaries, and the selection of proper beneficiaries. Also discussed were various theoretical difficulties associated with the quantification and allocation of the benefits of specific expenditures when beneficiaries are identifiable, as well as expenditures on such public goods as national defense, public health and law enforcement.

In general, the conventional total benefits equal total costs approach, or the approach which equates benefits to "costs incurred on behalf of" expected beneficiaries, has been adopted in this study. It offers the most consistent and practical way of dealing with the empirical estimates of expenditure incidence.

After the 1963 and 1969 expenditures were classified into functional categories, and each type or category was explained as to its nature and the bases upon which the intended benefits could be allocated, all expenditures were systematically distributed to households in different income brackets. It was noted that the five major groups of public expenditures in Thailand, classified according to their function, are: economic, educational, health and welfare, general and debt payments. Of these, general service expenditures, encompassing defense and general public administration, are the largest. To determine the absolute amounts of expenditure benefits by income classes, money income and adjusted income

bases were used as denominators to arrive at the effective expenditure rates by type of expenditures as well as by total expenditure. These calculations form the basic estimates of expenditure incidence.

Expenditure incidence in Thailand in 1963 and 1969 ranged between slightly regressive to mainly proportional depending upon the income bases used. When money income is used as a base, the incidence pattern is generally regressive because the distribution of money income had a much wider disparity than the distribution of adjusted income. When adjusted income is used as the base, the incidence pattern becomes practically proportional. The lowest income bracket usually received the highest benefits per income than all other income brackets except for such expenditures as higher education and debt payments.

Agricultural, primary education, and health and welfare expenditures proved to be the major items benefiting the lower income households relatively more than the upper income households. The fact that transportation expenditures benefited the lowest and the highest income classes relatively more than others may be because the lowest group, in the farming sector, gained through easier access to markets to sell their produce, and the highest group benefited through shorter travel time for business and pleasure. Other expenditures were small and tended to benefit all income classes equally.

The change in the pattern of income distribution after government expenditures were allocated was quite small on the money income base and even more so on the adjusted income base. The computed rates of improvement in income equality due to government expenditures range from only 1.5 to 3.0 percent, depending upon which income concept is used.

A general conclusion which could be drawn from this chapter is that public expenditures in Thailand as represented by the 1963 and 1969 budgets have done very little to redistribute income between rich and poor households. The improvement in income equality as a result of these expenditure programs in the situation where they could be most redistributive (that is, when money income is used as a base) was less than 8 percent in 1969 and 6 percent in 1963. Otherwise, the effects of government expenditures left Thai households in very much the same condition as before the inception of the programs.

Although it is true that the 1969 expenditure programs were more income redistributive than those in 1963, it is doubtful that this can be taken as an indication of the government's intention or desire to redistribute income or reduce income inequality through expenditure policies. In 1969 there was a noteworthy increase in relative benefits going to lower groups at the expense of higher income groups through expenditures in such areas as agriculture, primary education, transportation and health, but such increases were relatively

small on the whole.

In all, the role of the government between 1963 and 1969 as an income redistributor through its expenditure policies was rather limited. If the lower income brackets are to benefit more from government services, emphasis should be placed more on funding programs more attuned to their needs, such as various agricultural services, basic educational facilities, improved health and welfare services, and so on, than on such general services as defense, law enforcement and public administration.

FOOTNOTES

[1]John H. Adler was the first to use this categorization of approaches. See his study, "The Fiscal System, the Distribution of Income and Public Welfare," in Fiscal Policies and the American Economy, ed. Kenyon E. Poole, (New York: Prentice-Hall, Inc., 1951), pp. 359-421.

[2]Ibid., p. 362.

[3]See Charles E. McLure, Jr., "On the Theory and Methodology of Estimating Benefit and Expenditure Incidence," paper presented at the Workshop on Income Distribution and its Role in Development, Programs of Development Studies, Rice University, April 26, 1974, (mimeographed). McLure distinguishes between the "expenditure incidence" and the "benefit incidence" with the former conforming to the study in the change in the distribution of income resulting from changes in relative product and factor prices, and the latter the change in household or individual income position after receiving real and imputed benefits from public expenditures. Since McLure's expenditure incidence study exists only in theory, the special meaning given to expenditure incidence which normally is interpreted as benefit incidence only serves to confuse the matter, at least in the context of the present study. Therefore, no such special meaning is followed here, and expenditure incidence and benefit incidence are still regarded as synonymous.

[4]W. Irwin Gillespie, "Effect of Public Expenditure on the Distribution of Income" in Essays in Fiscal Federalism ed. Richard A. Musgrave, (Washington, D. C., The Brookings Institution, 1965), pp. 122-186. (Gillespie's U. S. Study from now on); Idem., The Incidence of Taxes and Public Expenditures in the Canadian Economy (Ottawa: Queen's Printer, 1966). (Gillespie's Canadian Study from now on); Gian S. Sahota, "Public Expenditures and Income Distribution in Panama," United States Agency for International Development (USAID), Panama City, August, 1972, (mimeographed).

[5]These points were made by McLure, pp. 49-59.

[6]Referring to the famous Impossibility Theorem by Kenneth J. Arrow. See his Social Choice and Individual Values, 2nd ed. (New York: Wiley, 1963).

[7]See the two oft-quoted papers by Paul A. Samuelson "The Pure Theory of Public Expenditure," Review of Economics and Statistics, 36 (November, 1954), 387-89, and "Diagrammatic

Exposition of a Theory of Public Expenditure," Review of Economics and Statistics, 37 (November, 1955), 350-56.

[8]Kenneth V. Greene, "Collective Decision-Making Models and the Measurement of Benefits in Fiscal Incidence Studies," National Tax Journal, 26 (June, 1973), p. 184.

[9]See Luc De Wulf, "Fiscal Incidence Studies in Developing Countries: Survey and Critique," IMF Staff Papers, 22 (March, 1975), pp. 61-131.

[10]Ibid., p. 108.

[11]Development Economics Department, Public and Private Finance Division, World Bank. "Distributive Impact of Public Expenditures: A Research Proposal," September, 1973 (mimeographed).

[12]To put it more obtusely, a researcher in expenditure incidence study should not feel uneasy about using the word "beneficiaries" particularly when another, more detached word is to be used which in fact has the same meaning.

[13]See Gillespie's U. S. Study, pp. 140-5.

[14]See Henry Aaron and Martin McGuire, "Public Goods and Income Distribution," Econometrica, 38 (November, 1970), pp. 907-20; Shlomo Maital, "Public Goods and Income Distribution: Some Further Results" Econometrica, 41 (May, 1973), pp. 561-68. The benefit allocation criteria used by Aaron, McGuire and Maital are quite unique but somehow their principal use in this study is rather inappropriate. See Appendix H in this study for the fiscal incidence result in Thailand based on Aaron-McGuire-Maital methods and the reasons why they are not used in the main study.

[15]Admittedly, the general methodology chosen here does not differ a great deal from what has been adopted in most other expenditure incidence studies. Nevertheless, this present study is an intertemporal study where the changes in the patterns of income distribution as a result of government expenditures between two reference years are compared. On the belief that the conceptual difficulties inherent in an incidence study are much reduced with an intertemporal investigating method, this is an important improvement over the conventional one-period benefit incidence study where the original or "pre-fisc" and "post-benefit" income distributions within a single period are compared.

[16]See, for example, Otto Eckstein, Water Resource Development (Cambridge, Mass.: Harvard University Press, 1958). John V. Krutilla and Otto Eckstein, Multiple Purpose River Development (Baltimore: Resources for the Future, Inc., 1954).

[17]Thailand, Royal Irrigation Department "Feasibility Report on Lam Ta Kong Storage Dam Project, Korat Province," Vol. 1: Project Evaluation, Bangkok, April, 1963 (mimeographed): Idem., "Report on Kang Krachan Project," Bangkok, February, 1961 (mimeographed).

[18]Ammar Siamwala, "Rice," Thammasat University Journal 3 (May, 1974), p. 22. Leslie E. Small, however, argues that at least the irrigation expenditures in the Central Plain areas produced the positive internal rate of return on the investment in the order of 6 to 9 percent. The problem of lack of farmers' initiative in response to the opportunities presented by the system (such as their non-production in dry season despite the availability of water) is still recognized and regarded as real and serious, and deserves special attention. See Leslie E. Small, "Water Control and Development in the Central Plain of Thailand," Southeast Asia, (Spring, 1974), pp. 679-697.

[19]The idea that the allocation rules be so established originated from the studies on marketing channels of various agricultural products in the Central and Northeastern parts of Thailand. From these studies, it was known how a certain agricultural product passed through from a farmer to a middleman to a transport operator and so on until it reached the final consumer within each farming season. The percentage share of the profit margin to each of these agents would be a good indicator of how benefits from increased yields as a result of irrigation spending should be allocated. The 70-30 breakdown seems to be an appropriate criterion after various studies have been consulted. See Siamwala, pp. 65-74 for a summary of such marketing channel studies.

[20]The Department of Civil Aviation operates all airports in Thailand including Bangkok International Airport. Since only the really well-to-do travel by plane domestically and internationally, it is logical to assume that only the top income group benefits from this type of public expenditure.

[21]This 53/47 breakdown was obtained from Thailand, National Statistical Office, Statistical Yearbook of Thailand, No. 29, p. 281.

[22]See Gillespie's U. S. Study, pp. 140-45; see also Gillespie's Canadian study, pp. 97-105.

[23]Information obtained from the Department of Land Transport and the Police Department.

[24]See Gillespie's U. S. Study, pp. 146-147 and Gillespie's Canadian Study, pp. 105-110.

[25]Thailand, Ministry of Education, Education in Thailand: 1963 (Bangkok, no date).

[26]Thailand, National Statistical Office, Quarterly Bulletin of Statistics, 20 (March, 1972), p. 17.

[27]Thailand, National Educational Council, Private Expenditures of University Students, 1968-1969, (Bangkok, 1973).

[28]A rather odd, not so important but quite interesting example is seen in the part of defense appropriation which was spent on building and operating some golf courses in Thailand or the creation of a governmental administrative body supervising the operation of security market. Only higher income groups could benefit from such "general" expenditures.

[29]See Jacob Meerman, "Fiscal Incidence in Empirical Studies of Income Distribution in Poor Countries," AID Discussion Paper No. 25, December, 1972 (mimeographed), p. 6. Perhaps a good test regarding the benefits of a defense system is to see who is most affected when such defense system collapses. It would be interesting to know the income distribution of those individuals or families who managed to flee a country after its defense system collapsed under external attack such as in South Vietnam or Cambodia in 1975. If most of these refugees were in higher income brackets, then the assumption adopted here is not entirely false.

[30]Arnold C. Harberger, "Fiscal Policy and Income Distribution," paper prepared for the Workshop on Income Distribution in Less Developed Countries," Princeton University, June 12-13, 1974, p. 11.

[31]In the actual estimation, small principal payments were also included in these interest payments; the same analysis is assumed to apply for both these payments.

[32]See Gillespie's U. S. Study, pp. 157-158 and Gillespie's Canadian Study, pp. 128-137.

[33]McLure, p. 47.

[34]Ibid.

[35]Among them Gillespie; Sahota; Richard A. Musgrave and Peggy B. Musgrave, Public Finance in Theory and Practice (New York: McGraw-Hill, 1973), Edita Tan, "Taxation, Government Spending, and Income Distribution in the Philippines," paper presented for the Joint JERC-CAM Seminar on income

distribution, employment, and economic development in Southeast and East Asia, Tokyo, December 16-20, 1974.

[36]Thailand, Bank of Thailand, Monthly Bulletin. 12 (June, 1973), p. 36.

CHAPTER V

THE NET FISCAL INCIDENCE

Unlike the previous two chapters, this one involves no major theoretical difficulty; it deals with the straightforward subtraction of the tax incidence of Chapter 3 from the expenditure incidence of Chapter 4 to arrive at the net fiscal incidence of the government tax and expenditure activities. More specifically, this chapter will account for the income distributional effects of government taxes and expenditures in two customary ways. First, the effective expenditure rate of each income bracket will be subtracted by the effective tax rate of the same corresponding income class. The result may be called the effective fiscal rate or the net fiscal incidence of the Thai fiscal system. Second, the net effect of expenditure benefits minus tax burdens of each income class will be added to the "pre-fisc" or the original before-tax and before-benefit income distribution to see whether or to what extent the "post-fisc" or the after-tax and after-benefit income distribution changes. Alterations in the Gini concentration ratios associated with changes in income distributions also will be estimated.

Effective Fiscal Rates or Net Fiscal Incidence by Income Classes

As the estimates of tax and expenditure incidence in Chapters 3 and 4 were carried out on the same five income brackets in 1963, and seven income brackets in 1969, the absolute fiscal incidence and the effective fiscal rates for those years can be obtained simply by subtracting the tax burden (effective tax rate) pertaining to each particular income bracket from its expenditure benefit (effective expenditure rate). For example, the absolute net fiscal incidence of the lowest income bracket (under Baht 3,000) in 1963 would be Baht 2,229.7 million minus Baht 1,911.0 million, or Baht 318.7 million.

Table 5.1 shows the absolute net fiscal incidence by income classes in 1963 and 1969. The effective fiscal rates can be estimated by dividing these absolute incidence figures by the relevant money and adjusted income levels. The resulting effective fiscal rates by income classes are shown in Table 5.2.

Essentially, an effective fiscal rate shows the relative net benefit (or net loss if the effective fiscal rate has a negative sign) which the households in different income brackets have received from the tax and expenditure policies of the government as a percentage of their money or adjusted income. The use of income as a weight is important in this incidence study because these rates across income classes could reveal whether the fiscal structure is regressive (pro-poor),

Table 5.1--Absolute Net Fiscal Incidence, 1963 and 1969
(Amounts in Millions of Baht)

Income Classes (Baht	1963	1969
Under 3,000	318.7	941.5
3,000- 5,999	138.5	697.2
6,000- 8,999	} 402.7	452.2
9,000-11,999		375.1
12,000-14,999	} 67.1	190.8
15,000-17,999		163.7
18,000 and over	694.1	1,010.8
All Classes	1,621.2	3,831.3

Source: Tables 3.2, 3.3, 4.3 and 4.4.

Table 5.2--Effective Fiscal Rates Based on Money and Adjusted Income, 1963 and 1969: Assumption I[a]

Income Classes (Baht)	Based on Money Income		Based on Adjusted Income	
	1963	1969	1963	1969
Under 3,000	7.1	38.9	2.1	10.7
3,000- 5,999	2.8	11.6	1.2	4.0
6,000- 8,999	} 4.4	6.6	} 2.1	2.7
9,000-11,999		6.3		2.9
12,000-14,999	} 1.5	3.7	} 0.7	1.8
15,000-17,999		3.7		1.9
18,000 and over	6.0	3.0	2.9	1.4
All Classes	4.7	5.9	2.1	2.6

[a]These are effective fiscal rates under Assumption I where the budget deficit is assumed to add directly to the income of households without reduction in real income through possible price increase.

progressive (pro-rich), or proportional. In general, a regressive fiscal system would generate relatively greater net benefits to lower than to higher income classes, so that the effective fiscal rates will fall as the level of income rises. The opposite is true with a progressive fiscal system. A proportional or neutral fiscal system would be indicated by a constant effective fiscal rate across income brackets.

Before proceeding to discuss the effective fiscal rates illustrated in Table 5.2, the reader should be informed about one important point about these rates. Both the 1963 and 1969 budgets were unbalanced: The expenditures to residents exceeded the tax receipts from residents by Baht 1,621.2 million in 1963, and by Baht 3,831.0 million in 1969. These deficits are assumed to raise or add to the income of households without any reduction in the income of the same households either through taxes or through price increase. Table 5.2 was calculated on the assumption that the budget deficit has a "zero repercussive effect" upon any price adjustments that might occur due to the existence of such a deficit. In other words, the deficit merely adds more income to households without them having to sacrifice or suffer in any other way.[1] Hereafter this assumption will be referred to as Assumption I.

With the preceding qualification in mind, Table 5.2 may be examined. Three points are apparent:

(1) The average effective fiscal rates for all income classes for 1963 and 1969 were 4.7 and 5.9, respectively, under the money income base, and 2.1 and 2.6, respectively, under an adjusted income base.

(2) All effective rates are positive across all income classes, meaning that, under Assumption I, all income classes gained absolutely from government fiscal activities.

(3) The overall net incidence pattern in 1969 could be described as moderately regressive (pro-poor) under the money income base to slightly regressive under the adjusted income base. In 1963 no clear incidence pattern is discernible. As the effective fiscal rates fluctuate slightly throughout the income range, the net fiscal incidence pattern could appropriately be termed a wandering proportional one. It is noted, however, that the effective fiscal rates for the top income class are higher than the average fiscal rates for all income classes. This indicates that, indeed, the effects of tax and expenditure policies was to redistribute income from some lower income brackets to this top income bracket, certainly a redistribution in the wrong direction if one hypothesizes that a more egalitarian distribution is desirable.

The pattern of net fiscal incidence perhaps may be seen more easily in the graphical presentation in Figures 5.1 and 5.2. In these figures the effective fiscal rates are plotted along the vertical axis and the average money income of households along the horizontal axis.

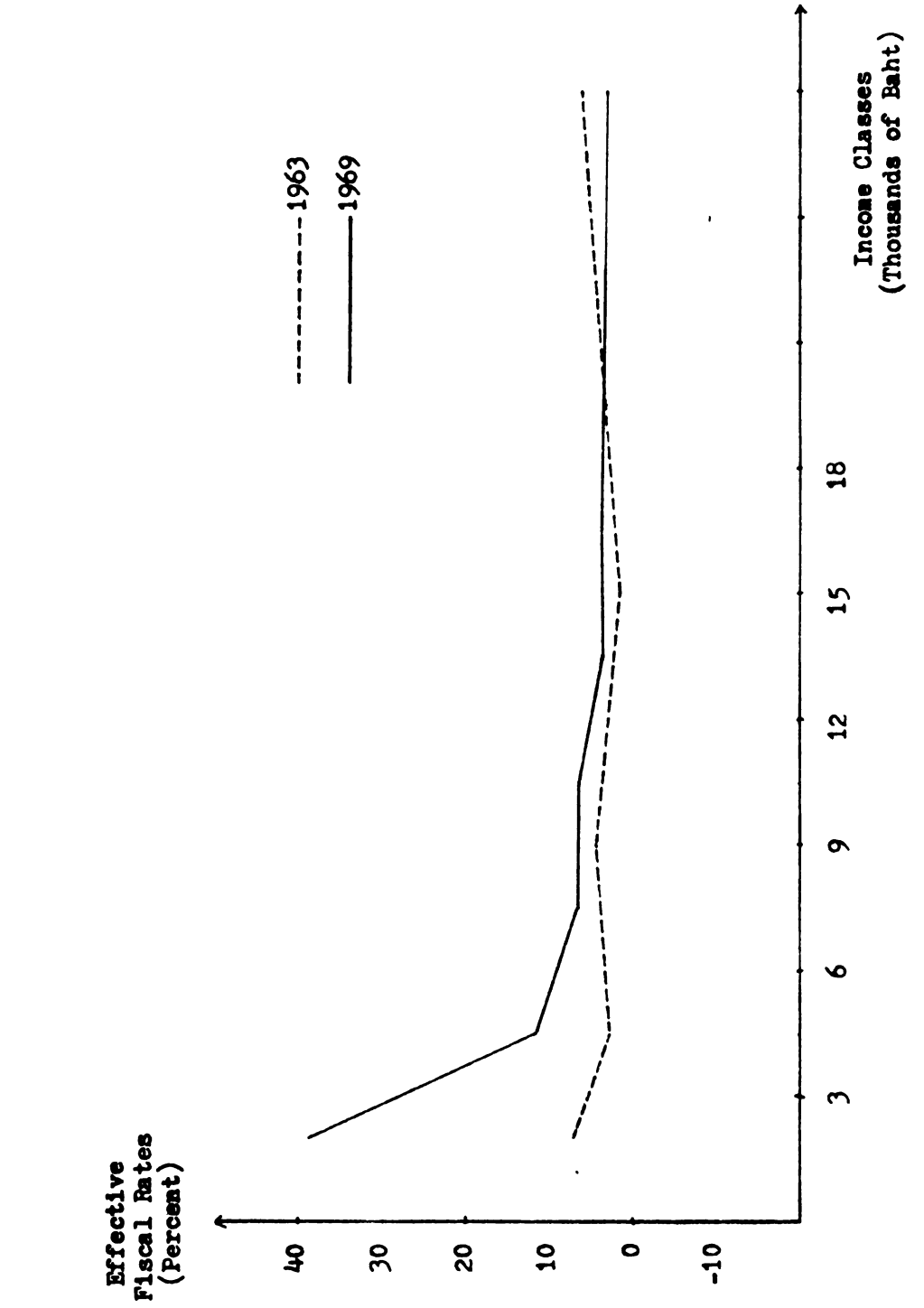

Figure 5.1--Effective Fiscal Rates Based on Money Income, by Income Classes, 1963 and 1969

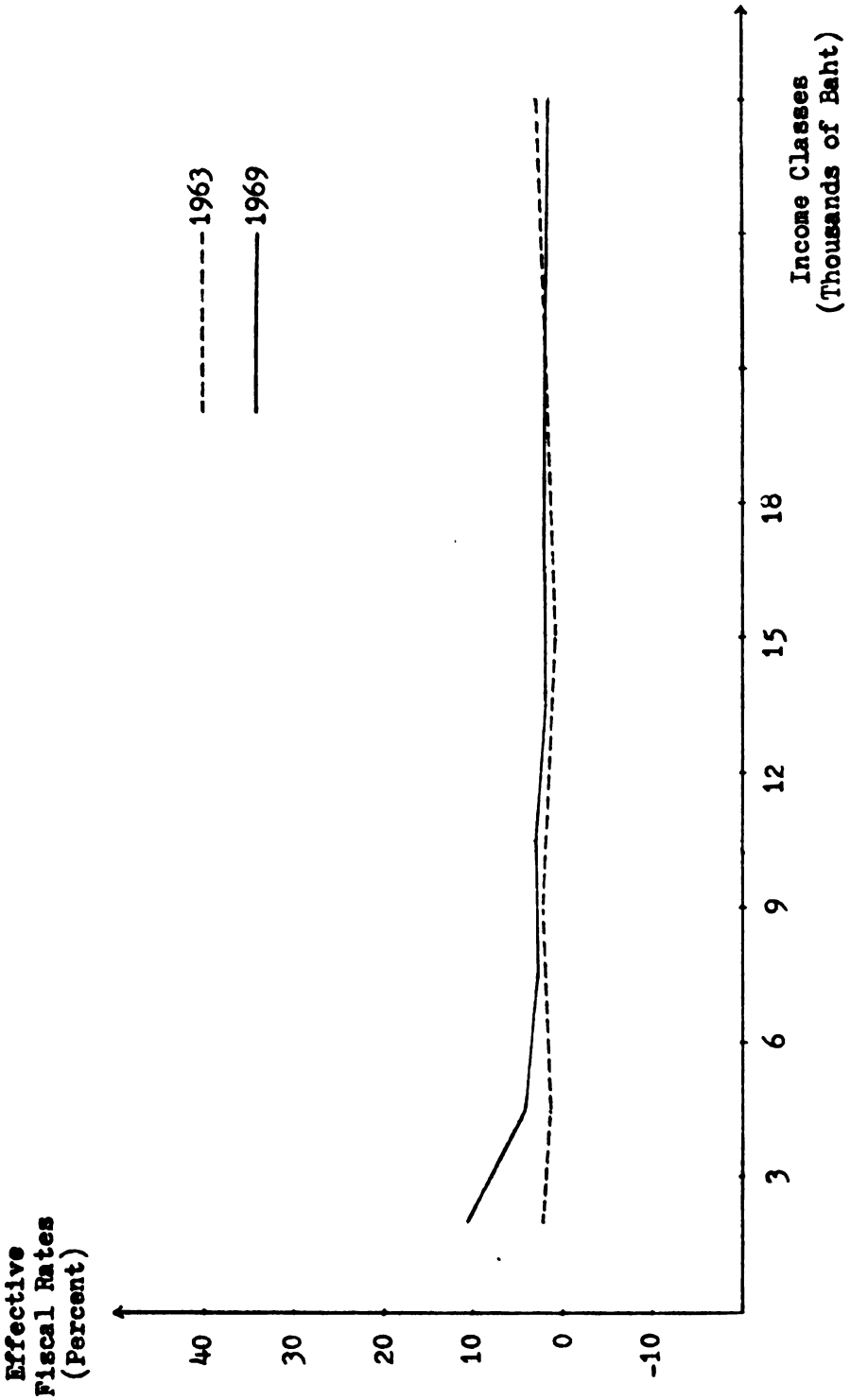

Figure 5.2--Effective Fiscal Rates Based on Adjusted Income, by Income Classes, 1963 and 1969

From Figures 5.1 and 5.2 it is clear that the 1969 fiscal systems were more regressive than those in 1963 both in the level and the pattern of net incidence. Under a money income base, the 1963 net fiscal incidence has a somewhat U-shaped pattern, although a very shallow one, whereas the 1969 net fiscal incidence has a monotonically downward sloping pattern throughout. Under an adjusted income base, the net fiscal incidence patterns were practically proportional in both years, with the situation in 1969 being slightly more favorable to the lowest two income classes.

Following the practice adopted in the tax and expenditure analysis, it is possible to generalize about the net fiscal incidence pattern in the same way as the tax and expenditure incidence patterns, that is, by regressing the effective fiscal rates upon the average household money income using the ordinary least-squares method. The functional form for the net fiscal incidence pattern, however, differs slightly from the original functional form for the tax and expenditure incidence patterns. Instead of expressing effective fiscal rates as a function of the annual average money income of households, the new functional form expresses effective fiscal rates as a function of the logarithms of the annual average money income of households. The main reason for the change is because the new functional form gives a much better goodness of fit than the original form.[2]

The results of the generalized regression functions of net fiscal incidence are shown in Table 5.3, and these

Table 5.3--Generalized Net Fiscal Incidence Functions: Assumption I [(Effective Fiscal Rate) = a + b log (Average Annual Money Income)[a]]

	Intercept	Slope	R^2
(1) On Money Income Base			
1963	8.14	-1.044	.8085
1969	109.51	-25.066	.8420
(2) On Adjusted Income Base			
1963	0.08	+0.407	.8388
1969	29.19	-6.472	.9014

[a]Average Annual Money Income in Thousands of Baht

give general support to the results in Table 5.2 and Figures 5.1 and 5.2. The net fiscal incidence pattern in 1963 was barely regressive under the money income base and actually turned progressive under the adjusted income base, the same pattern in 1969 was clearly regressive throughout under both income bases. Comparing fiscal activities in 1963 and those in 1969, the latter were definitely more income equalizing than the former. The more exact extent to which the two fiscal programs helped change the equality in the distribution of income will be discussed in the next section.

The Effects of Fiscal Activities on the Distribution of Income

Of paramount concern in a fiscal incidence study is the following question: What is the impact of government fiscal activities upon the distribution of income of households? The effective fiscal rates discussed earlier showed mainly the level of fiscal incidence or net benefits weighted by two income concepts, and the general pattern of progressivity or regressivity of the fiscal programs. This section will examine the effects of such fiscal programs from another aspect, that is, the relative income position of each income class after net benefits from the government sector were added to the original, pre-fisc income levels.

Table 5.4 presents the distribution of post-fisc money and adjusted income of households in 1963 and 1969. Let us first consider the money income portion of that table. Regardless how one views it, the degree of change in the pattern

Table 5.4—Percentage Distribution of Pre-Fisc and Post-Fisc Money and Adjusted Income by Income Classes, 1963 and 1969: Assumption I

Income Classes (Baht)	Money Income Distribution				Adjusted Income Distribution			
	1963		1969		1963		1969	
	Pre-Fisc	Post-Fisc	Pre-Fisc	Post-Fisc	Pre-Fisc	Post-Fisc	Pre-Fisc	Post-Fisc
Under 3,000	13.0	13.3	3.7	4.9	19.8	19.8	6.0	6.5
3,000- 5,999	14.0	13.8	9.3	9.8	14.5	14.3	11.9	12.1
6,000- 8,999	} 26.4	} 26.3	10.6	10.7	} 24.0	} 24.0	11.6	11.6
9,000-11,999			9.2	9.3			9.0	9.0
12,000-14,999	} 13.1	} 12.7	8.1	7.9	} 11.3	} 11.2	7.1	7.1
15,000-17,999			6.8	6.6			5.9	5.8
18,000 and over	33.5	34.0	52.3	50.8	30.5	30.7	48.5	47.9
All Classes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

of income distribution from the pre-fisc to the post-fisc situation can only be described as insubstantial. In 1963 the lowest income bracket gained less than one-half of a percentage point in its relative income position, whereas the positions of the middle three brackets slightly worsened, and the top income group gained by about 0.5 percentage points. In 1969, the degree of change was more distinct, yet still small. Of seven income brackets, the first four appear to be gainers and the last three losers, with the lowest income group gaining the highest and the top income group losing the most.

When adjusted income is used as the base, the redistributional results become even smaller. The pre-fisc and the post-fisc income distributions in both 1963 and 1969 look almost identical, attesting to the fact that the fiscal activities of the government had very small income redistributional effects indeed upon Thai households. That there was more income redistribution in 1967 than in 1963 is obvious from Table 5.4. Still, it would be interesting to see exactly how much the fiscal policies of each year affected the inequality of income as measured by Gini concentration ratios.

Table 5.5 presents the estimates of Gini concentration ratios before and after government fiscal activities took effect, and the percentage changes in these ratios both between the pre-fisc and the post-fisc situations of a single year and between the post-fisc situations of 1963 and 1969.

Table 5.5--Pre-Fisc and Post-Fisc Gini Concentration Ratios and Percentage Changes in Income Inequality, 1963 and 1969: Assumption I

Year	Gini Coefficients		Percentage Decrease (-) or Increase (+) in Gini Coefficient Within the Period	Percentage Decrease (-) or Increase (+) in Gini Coefficient Between 1969 and 1963	
	Pre-Fisc Income Dist.	Post-Fisc Income Dist.		Pre-Fisc Income Dist.	Post-Fisc Income Dist.
(1) On Money Income Base					
1963	.5627	.5581	-0.82	} -1.37	} -5.23
1969	.5550	.5289	-4.70		
(2) On Adjusted Income Base					
1963	.4559	.4566	+0.15	} +5.77	} +3.48
1969	.4822	.4725	-2.01		

On a money income base, the 1963 post-fisc income distribution improved from .5627, the pre-fisc Gini ratio, to .5581, reducing the inequality area by 0.8 percent. The similar change for 1969 was from .5550 to .5289, or a rate of improvement in income equality of 4.7 percent. Comparing the post-fisc distributions based on money income in both years, the effect of the 1969 fiscal policies accounted for a reduction of almost 4 percentage points in the inequality index from 1963.

Such an effect is much reduced when adjusted income is used as a base. The pre-fisc Gini ratios were .4559 and .4822, respectively, for 1963 and 1969. As a result of taxes and expenditures, they changed to .4566 and .4725, indicating a very slight worsening in income equality in 1963 and a slight improvement of the same in 1969. Nevertheless, the overall effect in comparing the 1963 to the 1969 post-fisc adjusted income distribution is seen to be a general worsening in the degree of income equality by about 3.5 percent. This certainly does not mean that fiscal activities in 1969 made households worse off than fiscal activities in 1963. On the contrary, 1969 policies did redistribute income from higher to lower income classes, thus improving the Gini ratios of income inequality. However, as the pre-fisc income distribution based on the adjusted income concept became more unequal in 1969 compared to 1963, the tax and expenditure policies in 1969, which were only slightly regressive to proportional, were not strong or redistributive enough to offset the deterioration in income equality due to governmental

and other undetermined external influences.

Since the 1969 pre-fisc distribution shows an approximate 5.8 percent deterioration in income equality from 1963 on the distribution of income based on adjusted income, and since the increase in the Gini ratio in the 1969 post-fisc income distribution was only 3.5 percent, then roughly 2.3 percentage points should be regarded as the extent to which 1969 fiscal policies reduced income inequality from 1963 based on adjusted income. Similarly, on a money income base, the post-fisc distribution in 1969 was 5.2 percent more equal than the similar distribution in 1963. Compared to 1.4 percent which is the extent to which the 1969 pre-fisc distribution was more equal than the 1963 pre-fisc distribution, it could be said that the 1969 fiscal activities had about 3.8 percentage point (that is, 5.2 percent minus 1.4 percent) more income equalizing power than the 1963 fiscal activities. These two figures (3.8 percentage points and 2.3 percentage points) should indeed be identical; the small divergency is probably due to errors in statistical estimation.

It could be concluded, therefore, that between 1963 and 1969 the government, through its taxes and expenditures, effected between a 2.3 and 3.8 percentage point reduction in income inequality as measured by Gini coefficients, a feat which could easily have been accomplished by imposing only a 2.5 percent extra tax on the income of the highest income group in 1969 and transferring this amount of tax revenue to the lowest income households.[5] Also, the reader is reminded

that the 2.3 to 3.8 percentage point reduction mentioned above is true only under Assumption I, where the budget deficit is assumed to have no detrimental effect through price adjustments but to add directly to the income of households. Had this assumption been proven untenable or false, the pattern of post-fisc income distribution could have changed, and this, of course, could have resulted in a greater inequality index. It is possible, as will be shown later, that depending on alternative assumptions about the income distributional effects of a budget deficit, the government could indeed worsen, not improve, the income equality of households through its fiscal activities.

Budget Deficit in Fiscal Incidence Studies

The significance of the existence of a deficit in the public sector is generally recognized in almost all fiscal incidence studies. Gillespie devoted a substantial part of his Canadian study to a discussion of how the problems should be dealt with in an empirical investigation.[3] Similar efforts also have been made by J. A. Johnson and G. S. Sahota.[4] The results, however, have been less than gratifying, for there is still no single most satisfactory way of dealing with the empirical estimation of the possible distributional impact of the budget deficit and its financing.

A budget deficit is said to exist when the government's expenditures exceed its revenues in any fiscal year. There are several avenues open for the government to finance

such a deficit. It may print more money, use up past reserves, borrow from domestic as well as foreign sources, or receive financial help from overseas. Normally, the government will use a combination of these methods. What is most pertinent here is the government policy of increasing the money supply, since this will normally raise the price level in most economies unless they are characterized by high unemployment or underutilization of resources. The increase in the price level could either partially reduce the income generating power of the deficit (that is, through the income multiplier), or eliminate it completely depending upon other factors.

The problem is further complicated by the fact that even if the overall extent of the price increase is known, it is still difficult to know how different income brackets are differently affected by such an increase. Various studies have been directed to answering the question of who would be affected by price increases, and by how much, but the results obtained so far are not conclusive. Generally, however, it is believed that lower income groups suffer more under inflation compared to higher income groups, for several reasons: A higher proportion of the income of the poor is spent on necessary consumption, such as food and clothing, which usually is subject to price increases more than other items, or the earnings of the poor do not increase as fast as the price level, or other factors.[6] Also, if the traditional view is correct that inflation harms wage-earners and other fixed-income groups but benefits property owners and business firms,

then this would imply that the lower brackets will suffer more than the upper brackets since wage and salary earners generally tend to be bunched in the lower to middle income groups, and the business operators and property owners in the higher income groups.

But the foregoing discusses only one dimension of the problem; many other questions regarding a budget deficit could be considered, among them: What if deficit financing causes not only a price increase but also unemployment? How does one isolate the portion of the deficit that affects only nonresidents? How does one account for the distributional effects of the deficit financed by foreign assistance? These problems cannot be solved unless certain assumptions are made as to how the government's deficit should be treated. Most fiscal incidence studies seem to ignore the income distributional effects of the public deficit and assume that it only adds to existing income, just as it has been treated thus far in this study. A few alternative assumptions designed to "eliminate" the deficit also have been used, resulting mainly in the change in the level of net incidence but not its pattern.

In Thailand the "functional" budget deficit amounted to Baht 1,621.2 million in 1963 and Baht 3,831.9 million in 1969. By "functional" is meant the deficit which affects only the resident households considered in this study, not the actual accounting deficit, nor the total amount of public

borrowing to finance the deficit in that year. In other words, the functional deficit is derived simply from subtracting the total adjusted tax revenues from the total adjusted expenditures in each year.

Three assumptions concerning the treatment of budget deficits are considered in the case of Thailand. Assumption I has already been discussed: The deficit is assumed to have a zero or no repercussive effect on price adjustments due to the existence of the deficit and its financing. This has been the standard assumption so far. According to Assumption II, the price effect is assumed to cancel out completely the income generating effect of the deficit. The deficit is then eliminated, and the budget is hypothetically balanced. However, only the level of net benefit is changed, not its pattern. Assumption III is somewhat similar to Assumption II, that is, the price effect is assumed equal to the income effect, but the distribution of the effect by income classes is assumed to be more burdensome to the lower than to the upper income classes. As the net fiscal incidence according to Assumption I has already been considered, only Assumption II (deficit with "neutral" repercussive effect) and Assumption III (deficit with "de-equalizing" repercussive effect) will be discussed below.

When the deficit is eliminated and the effect on existing income distribution is neutral (Assumption II), the change in the effective fiscal rates is simply a matter of subtracting the average net benefit rate for all income

classes from the effective fiscal rate derived under Assumption I of each income bracket. The new effective fiscal rates would not be all positive, meaning that the deficit finance benefited some and not others. However, post-fisc income distribution would remain the same, since the neutral effect touches only the level of effective fiscal rates, not the ensuing distribution of income.

Under Assumption III, the deficit is said to cause a relatively heavier burden to the lower than to the upper income classes, due to price adjustments. As there is no basis upon which such a deficit could be deducted from each income class, it is arbitrarily assumed that each household is equally affected by it. In other words, financing the deficit has the effect of a poll tax upon each head of household in Thailand. Since most households are found in the lower spectrum of the income distribution scale, the elimination of a deficit in this way appears to "de-equalize" income equality.

The results of the hypothetical elimination of a functional budget deficit using the above two assumptions are shown in Tables 5.6 and 5.7. Table 5.6 shows the effective fiscal rates under Assumption II and Table 5.7 shows the resulting percentage distribution of income under Assumption III.

Although the pattern of effective fiscal rates in Table 5.6 is the same as that shown in Table 5.2, use of Assumption II gives a clearer view of whether and in which direction the redistribution has occurred. In 1963, on both

Table 5.6--Effective Fiscal Rates Based on Money and Adjusted Income, 1963 and 1969: Assumption II

Income Classes (Baht)	Based on Money Income		Based on Adjusted Income	
	1963	1969	1963	1969
Under 3,000	+2.4	+33.0	+0.1	+8.1
3,000- 5,999	-1.8	+5.7	-0.8	+1.4
6,000- 8,999	} -0.3	+0.6	} +0.1	+0.1
9,000-11,999		+0.4		+0.3
12,000-14,999	} -3.2	-2.3	} -1.3	-0.8
15,000-17,999		-2.2		-0.7
18,000 and over	+1.3	-2.9	+0.8	-1.2
All Classes	0	0	0	0

Table 5.7--Percentage Distribution of Pre-Fisc and Post-Fisc Money and Adjusted Income, by Income Classes, 1963 and 1969: Assumption III

Income Classes (Baht)	Money Income Distribution				Adjusted Income Distribution			
	1963		1969		1963		1969	
	Pre-Fisc	Post-Fisc	Pre-Fisc	Post-Fisc	Pre-Fisc	Post-Fisc	Pre-Fisc	Post-Fisc
Under 3,000	13.0	11.8	3.7	3.8	19.8	19.2	6.0	6.0
3,000- 5,999	14.0	13.5	9.3	8.9	14.5	14.2	11.9	11.8
6,000- 8,999	} 26.4	} 26.6	10.6	10.4	} 24.0	} 24.1	11.6	11.4
9,000-11,999			9.2	9.2			9.0	9.0
12,000-14,999	} 13.1	} 13.0	8.1	8.0	} 11.3	} 11.3	7.1	7.1
15,000-17,999			6.8	6.8			5.9	5.9
18,000 and over	33.5	35.2	52.3	52.9	30.5	31.2	48.5	48.8
All Classes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

money and adjusted income bases, the middle three income brackets seemed to be the net losers or redistributors of income to the top and bottom income brackets. In 1969, it was also clear that the top three income groups under both income bases were the net losers. Again, it must be mentioned that the extent of redistribution is quite small in both years.

A new kind of picture emerges when the deficit is eliminated under Assumption III. As expected, the lower income classes now appear to be the heavy losers (in 1963) or small gainers (in 1969); in all cases, the top income class received positive gains. The net fiscal incidence pattern no longer could be called slightly regressive to proportional, as before, but rather proportional to slightly progressive.

The above assertion is supported by the change in the post-fisc income distribution under Assumption III shown in Table 5.7. That the lower income classes are worse off and the upper income classes better off after the effects of government fiscal activities than before is clearly evident in both years. In 1963, for example, the post-fisc income share of the lowest bracket fell from 13.0 percent to 11.8 percent under the money income base, and from 19.8 percent to 19.2 percent under the adjusted income base. In 1969, the income position of the lowest income class was actually improved by a very small percentage, but the positions of the three lowest brackets taken together deteriorated. Improvement in the top income group's position ranges from as low as 0.3 to as high as 1.7 percentage points.

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The pre-fisc and post-fisc Gini concentration ratios and percentage changes in these ratios in, and between, 1963 and 1969 under Assumption III are presented in Table 5.8. In 1963, the post-fisc Gini concentration ratios under Assumption III increased from .5627 to .5838 based on money income, and from .4559 to .4660 based on adjusted income. The corresponding increase in 1969 was from .5550 to .5614, and from .4822 to .4853. The percentage increase in income inequality from the pre-fisc to the post-fisc situation is estimated at between 2.2 to 3.8 percent in 1963 and between 0.6 to 1.2 percent in 1969, depending upon the income concepts used. This is a startling change from the results under Assumptions I and II because, under those assumptions, at least the post-fisc money income distribution improved over the pre-fisc money income distribution in both 1963 and 1969; now, under Assumption III, the post-fisc income distribution under both income bases becomes more unequal than the pre-fisc income distribution. In short, under Assumption III, the government aggravated instead of mitigated income inequality in Thailand.

The question then arises as to whether Assumption III is too extreme. It does not appear to be. In fact, in the only study on the effects of price increases upon income distribution of households in Thailand, Dr. Oey Astra Meesook has commented that it is the lower income groups relative to the higher who are more adversely affected by general increases in the consumer price index. She reasons as follows:

Table 5.8--Pre-Fisc and Post-Fisc Gini Concentration Ratios and Percentage Changes in Income Inequality, 1963 and 1969: Assumption III

Year	Gini Coefficients		Percentage Decrease (-) or Increase (+) in Gini Coefficient Within the Period	Percentage Decrease (-) or Increase (+) in Gini Coefficient Between 1969 and 1963	
	Pre-Fisc Income Dist.	Post-Fisc Income Dist.		Pre-Fisc Income Dist.	Post-Fisc Income Dist.
(1) On Money Income Base					
1963	.5627	.5838	+3.75	} -1.37	} -3.84
1969	.5550	.5614	+1.15		
(2) On Adjusted Income Base					
1963	.4559	.4660	+2.22	} +5.77	} +4.14
1969	.4822	.4853	+0.64		

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> The poor suffer more first of all because total expenditures form a large percentage of their incomes so that there is less of an income margin, if any, to enable them to keep real consumption at a constant level. Moreover, when real consumption declines for the poor it is a serious problem if they are near or actually below subsistence level. Our calculations show that further aggravation of the problem is brought on by the unfavorably larger overall price increase facing the poor during recent years.[7]

Although Dr. Meesook has quantitatively compared the different distributional effects of price increases across income classes, such a scheme cannot be applied here due to differences in income class structures, income concepts, and periods under study. It is sufficient, nonetheless, to say that price increases due to deficit financing could have a de-equalizing effect upon the existing income distribution if it is assumed that each household equally bears the burden of such price increases, as Table 5.8 has shown.

Summary and Conclusions

This chapter has brought together the tax incidence estimation of Chapters 3 and the expenditure incidence estimates of Chapter 4, netting out the residual effects of government taxes and expenditures upon the distribution of income of households in Thailand in 1963 and 1969 and between these two years. As in Chapters 3 and 4, the results are presented in two ways, according to effective fiscal rates and income classes, and according to the changes in the original, pre-fisc income distribution after the net benefits have been

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added and showing the related changes in the Gini concentration ratios.

Under a money income base, the net fiscal incidence had a U-shaped pattern in 1963 with the lowest and the highest income groups enjoying the highest net benefits; in 1969 the pattern was monotonically downward sloping from the lowest to the top income group. Under an adjusted income base, the net fiscal incidence became more or less proportional in both 1963 and 1969, as expected. Because the net benefits to the lowest income classes were much larger in 1969 than in 1963, the 1969 fiscal programs were definitely more regressive or pro-poor than the 1963 programs.

The post-fisc distribution of money income both in 1963 and 1969 showed an improvement in income equality as measured by Gini concentration ratios when compared to the pre-fisc money income distribution in the respective years. Under the adjusted income base, however, the post-fisc distribution became slightly more unequal than the pre-fisc distribution in 1963, while in 1969 the improvement in income equality was still evident in the post-fisc distribution.

The foregoing conclusion is based on the assumption that the budget deficit which existed both in 1963 and 1969 only adds directly to the income of households. If the budget deficit is assumed to raise the price level, and if each household is assumed to suffer the price increase equally, then it can be shown that the post-fisc income distribution in both 1963 and 1969 would be more unequal than the corresponding

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pre-fisc income distribution. The purpose of this latter assumption is to demonstrate that the extent of income redistribution of the Thai government through its tax and expenditure policies is so small that, by changing the assumption as to how the budget deficit differentially would affect each income class, the government fiscal programs could become income de-equalizing instead of income equalizing.

Although the year 1969 showed a promising trend toward greater income equality (or less income inequality) over the year 1963 as a result of government fiscal policies, apparently this trend was too weak and too slow to be meaningful. This was mainly because, on the tax side, too much revenue was collected from indirect taxes and too little from direct taxes, and, on the expenditure side, too much benefit to the lower income classes was derived from such general expenditures as defense, law enforcement and public administration. It may be questionable to assume that one Baht's benefit from these general expenditures has exactly the same value as one Baht's benefit from such specific or transfer expenditures as educational spending and child allowances, at least from the point of view of the poorest section of the population.

If the more urgent objective of the government is to help the poorest section of the population, it would be most desirable for fiscal policies to be reoriented toward fewer indirect taxes and general expenditures, and toward more direct taxes and more specific and transfer expenditures, especially the categories which contribute most to the direct

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and indirect raising of the income positions of the poor households.

One final note about the significance of income level in relation to income inequality should be mentioned. By simply looking at the considerable increase in the income level in 1969 compared to 1963, one could be led to believe that the growing economy was simultaneously easing the income distribution problem. The study by this researcher and Chintana Chernsiri pointed out that even when the average annual income of a family in the lowest income class was tripled in 1969 it was still not sufficient to raise that family above the poverty level as defined for that year.[8] What is more crucial, of course, is the inequality in the distribution of income, a factor that easily could be overshadowed by the income rise.

In conclusion, it seems appropriate to quote a cogent statement made by Oey Astra Meesook on the issue of income growth and income inequality:

> A major question...is whether it is in fact the case that rapid overall growth of income makes it easier to bring about changes in the way that income is distributed. The argument usually put forward is that a rapid rise in income makes it unnecessary to actually redistribute income. By simply ensuring that a larger proportional increase accrues to the poor than to the rich, it is possible to improve the distribution of income in a way which is not disagreeable to the rich. Although this is a notion which is being bandied about a great deal, our analysis suggests that rapid growth of income may simply dull the pains of inequality: in a situation of high growth rates, it becomes less noticeable that there is still a great deal of inequality

around. People are fooled into thinking that their position has improved and are thus less likely to be politically troublesome.[9]

FOOTNOTES

[1]The most obvious case where this is possible is when the government finances the deficit through some windfall revenues, through past savings, or through foreign grants in a less than fully employed economy.

[2]The other reason is that the original functional form when used on the 1963 money income data gives a generalized net fiscal incidence curve with a positive slope, signigying a progressive net fiscal incidence pattern. This contradicts the result of the change in the post-fisc money income distribution as measured by Gini concentration ratios (to be discussed later in the chapter) which showed that under money income base the post-fisc income distribution in 1963 was still more equal than the pre-fisc income distribution of the same year. After an experiment with two other functional forms--the semi-log and the double-log--which showed the net fiscal incidence curve with a negative slope as expected, it was decided to use the semi-log functional form which also yielded the best overall goodness of fit. There was no contradiction regarding the net fiscal incidence slope under adjusted income in 1963, however; the positive slope was not unexpected.

[3]W. Irwin Gillespie, The Incidence of Taxes and Public Expenditures in the Canadian Economy. (Ottawa: Queen's Printer, 1966), pp. 164-179.

[4]James A. Johnson, The Incidence of Government Revenues and Expenditures (Ottawa: Queen's Printer, n.d.), pp. 73-6; Gian S. Sahota, "Public Expenditures and Income Distribution in Panama," United States Agency for International Development, Panama City, August, 1972, (mimeographed).

[5]The experiment was carried out by deducting 2.5 percent from the total money income of the highest bracket and adding this to the income of the lowest bracket. The new Gini coefficient was then computed from this new distribution of income the result of which was a reduction of about 4 percent in income inequality compared to the original income distribution.

[6]Oswald Brownlee and Alfred Conrad, for example, claim specifically that inflation not only hurts the lower income classes but also benefits the upper income classes. George L. Bach and Albert Ando, on the other hand, maintain that for

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a moderate inflation the redistributional effects are likely to be small, and more or less neutral. On a general context of incurring a public debt, however, Hugh Dalton and Alvin Hansen, among others, believe that internal debt creates higher relative real burden upon the lower income classes and is thus likely to intensify inequality of wealth and income rather than to mitigate it. See Oswald H. Brownlee and Alfred Conrad, "Effects upon the Distribution of Income of a Tight Money Policy," American Economic Review, 51 (May, 1961), pp. 74-85; George L. Bach and Albert Ando, "The Redistributional Effects of Inflation," Review of Economics and Statistics, 39 (February, 1957), pp. 1-13; Hugh Dalton, Principles of Public Finance (London, 1923), p. 192; Alvin H. Hansen, Fiscal Policy and Business Cycles (New York, 1941), p. 179.

[7]Oey Astra Meesook, "The Impact of Price Increases on Different Income Groups," Faculty of Economics, Thammasat University, August, 1975, p. 11 (mimeographed).

[8]Medhi Krongkaew and Chintana Chernsiri, "The Measurement of the Poverty Level in Thailand," Thammasat University Journal, 5 (June-September, 1975) (in Thai).

[9]Meesook, Income Distribution in Thailand (Bangkok: Faculty of Economics, Thammasat University, 1975), pp. 83-84.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS

Summary of Purpose and Procedures

The purpose of this study was to measure empirically the income redistributional impact of taxes and public expenditures in Thailand in, and between, 1963 and 1969. In the language of public finance this is known as a "fiscal incidence study." Unlike the more conventional type, however, this study emphasized the intertemporal effects of fiscal activities upon income distribution. In other words, it was primarily interested in comparing the change in income distribution as a result of fiscal activities in 1969 with 1963. To use more precise terminology, this research estimated and compared "post-fisc" income distribution in 1969 with "post-fisc" income distribution in 1963. Knowledge of the redistributional impact would be useful not only as a means of measuring the government's performance in terms of income distribution, but also as a policy guideline or as an indication of the direction in which the government might move if it wished to make some concrete changes in the existing pattern of income distribution.

The persistent and severe inequality of income in Thailand was one of the major factors prompting this study.

Since it is undoubtedly the government, more than any other element in the economy, which is capable of changing the pattern of income distribution of individuals or households, the investigation of the government's role in the distribution of income as reflected through its tax and expenditure policies, was a reasonable beginning. Such information would be a logical first step toward an efficient economic policy aimed at reducing the present income inequality. Admittedly, the ideological bias of this study is toward greater income and economic equality within the present democratic form of government.

The scope of the research was limited to the tax and expenditure impact on household income at the national level. Lack of data, time, and resources did not permit a more detailed investigation at the regional, provincial, or sectoral level. Nevertheless, the information gathered more than compensated for the above limitation. Within this framework, the study attempted to estimate income distribution in 1963 and 1969 as a basis for further estimation of tax and expenditure incidence.

Special attention was given to estimating the income distribution in 1963 and 1969 as accurately as possible. This was necessary because an incorrect or inaccurate income base could distort the true pattern of tax and expenditure incidence. The basic data for income distribution estimates for 1963 and 1969 were taken from the household expenditure survey of 1962-1963 and the socio-economic survey of 1968-1969

respectively. Both were conducted by the National Statistical Office of Thailand. However, the income distribution obtained was the distribution of money income, which is only part of real income. This latter is defined in the Simons-Haig tradition as consumption plus the change in net wealth. Many adjustments were made to money income in an effort to obtain a more comprehensive income base. Among the income elements added to money income were adjustments for the underreporting of income in the surveys and for under-estimated imputed rents of owner-occupied homes, income in kind, net corporate savings, and indirect taxes. The new income concept, called "adjusted income," was used as an alternative income base to the money income concept.

Once income bases were known, the burden of taxation by income classes was estimated. The procedures used did not differ substantially from other tax incidence studies. First, it was assumed that the burden of taxation should be measured in terms of a reduction in real income of taxpaying households. Then the question of incidence shifting had to be answered: Who ultimately bears the burden of each tax?

A large part of Chapter 3 was devoted to resolving this problem. When the incidence problems were resolved, each major tax and government revenue in Thailand was allocated to various households based on different allocation rules. These rules generally followed the patterns of household expenditures on certain groups of commodities and other distributive series, the information being available from the household

expenditure surveys. The incidence of the total tax programs falling on a particular income class was then obtained by summing up the absolute burden of each tax pertaining to that income class.

When these absolute burdens were expressed as percentages of income levels of each class, the result obtained was the effective tax rate by income class. Subtracting these amounts from the original or "pre-fisc" income distribution yielded the "post-tax" income distribution. To account for the distributional impact of the tax system by the simple subtraction of the absolute tax burdens from original income levels requires an assumption that the original or pre-fisc income distribution was indeed what would have resulted if the present tax system had been replaced by a proportional income tax of equal yield. This is the so-called differential incidence approach. Thus, the pre-fisc and post-tax income distributions within the same year could be compared, as could post-tax income distributions of two different years--in this case 1963 and 1969--for evidence of a change in income distribution.

In a similar fashion, the incidence of public expenditures was estimated by first assuming that public expenditures generate benefits that add to the real income of households. Conceptual difficulties inherent in the quantification of expenditure benefits, especially those from such social goods as national defense and public health, necessitated the adoption of the accounting approach to benefit

allocation, that is, the assumption that total benefits are equal to total costs. Thus, actual government spending is allocated to expected first-round beneficiaries, known as a "cost-incurred-on-behalf-of approach." Once this decision was made, public expenditures were classified into five functional categories, and consideration was given as to who the prospective beneficiaries were and how the benefits should be allocated. Then all benefits of each income class were summed and divided by corresponding income levels to arrive at the effective expenditure rates. These same benefits were added to the existing, or pre-fisc, income distribution to arrive at the new, post-benefit, income distribution. The reasoning underlying this procedure was that the patterns of the effective expenditure rates and the changes registered in the post-benefit income distribution should reveal the income redistributional nature of government expenditure programs.

Determining the net fiscal incidence, that is, the incidence of the entire fiscal program, was simply a matter of finding the net benefits (expenditure benefits minus tax burdens) of each income class and expressing them in relation to the income level of that income class. This process yielded the effective fiscal rates. When the net benefits were added to the existing income distribution, the new income distribution obtained is the "post-fisc" distribution. This, of course, was the final result and the one of prime interest in this study.

Conclusions

Since the main study is divided into three parts--tax incidence, expenditure incidence, and net fiscal incidence--the conclusions will be presented in the same way.

Tax incidence

The four conclusions concerning tax incidence are:

First, under a money income base, the tax programs in Thailand in 1963 and 1969 were generally--almost monotomically-regressive across income classes. The effective tax rates ranged from 20.8 to 42.7 percent, and from 25.7 to 47.0 percent, of household money income in 1963 and 1969, respectively. The pattern of tax regressiveness in these two years was practically identical.

Second, under the adjusted income base, the regressivity was almost eliminated; the tax systems exhibited a generally proportional pattern of incidence. The use of the adjusted income base therefore provided the lower bound of the effects of the tax programs, with the money income base providing the upper bound. If this interpretation is accepted, then the degree of tax burden in Thailand in 1963 and 1969 ranged from regressive to proportional at best; it could in no way be considered progressive.

Third, regarding specific taxes, only the personal income tax and taxes on property showed a progressive incidence pattern; the others showed either a clearly regressive pattern

(business taxes, selective sales taxes, and import duties), or a U-shaped pattern (government receipts from state monopolies). But very few taxes were progressive. Taxes on income and property combined constituted only about 8 percent of total government revenues in both 1963 and 1969.

Fourth, it is obvious that when a tax is regressive, the after-tax income distribution will be made more unequal. This was true in Thailand in 1963 and 1969. The degree of income inequality in the after-tax income distribution as measured by Gini concentration ratios, increased from 1.0 to 8.4 percent in 1963, and from 0 to 5.3 percent in 1969, depending upon the income concepts used. Although the Gini ratios revealed that the tax programs of 1969 were less income de-equalizing (or more income equalizing) than the 1963 programs, the reduction in the Gini coefficient was very small, amounting only to about one or two percentage points.

Expenditure Incidence

The four conclusions concerning expenditure incidence are:

First, based on the money income concept, the expenditure programs of the Thai Government in 1963 and 1969 showed a generally regressive or pro-poor pattern from the lowest to the highest income brackets. In 1969 the incidence pattern was clearly and steadily downward sloping, whereas in 1963 it was also downward sloping, but it turned slightly upward at the top income bracket. This pattern is almost identical

to that of the tax programs considered earlier, the only major difference being that the expenditure incidence of the lowest income class was much higher than the tax incidence of the same income class. This indicates that the poorest households reaped relatively greater net real benefits from government fiscal activities, at least from a money income point of view.

Second, when the adjusted income base was used, expenditure incidence flattened out considerably. The 1963 pattern, when show diagrammatically, became almost a straight line, while the 1969 pattern still showed a very high level of expenditure incidence in the lowest income class. But for the other classes, the incidence pattern was more or less proportional, with a slight increase in incidence in the middle portion of the household range. On the whole, except for the lowest income group in 1969, all income classes seem to have received benefits from public expenditures in amounts proportional to their adjusted income.

Third, hardly any expenditure item was shown to be progressive or pro-rich, with the exception, perhaps, of interest payments on the public debt, which is assumed to benefit upper income bracket debt holders. The expenditures most beneficial to lower income groups included those for agriculture, primary education, and health and social welfare. The benefits from general service expenditures, including mainly defense, law enforcement, and public administration, were also very regressive.

Fourth, if expenditure benefits are assumed to add directly to the income of households, the income distribution after expenditure benefits are allocated, or the "post-benefit" income distribution, must be more equal than the original, pre-fisc income distribution. In this study, the Gini concentration ratios for post-benefit income distribution in 1963 improved by about 0.7 to almost 5.7 percent over pre-fisc income distribution, depending upon the income concepts used. The corresponding rate of improvement in 1969 was between almost 1.7 percent to over 7.2 percent. The 1969 expenditure programs were more income equalizing than the 1963 programs, although both could be criticized for insufficient expenditures in the areas benefiting the poor most directly, such as primary education in rural areas and health and social welfare benefits. For maximum redistribution, too much was spent in both years in the areas of dubious benefit to the poor, such as in defense and general bureaucracy.

Net Fiscal Incidence

Concerning net fiscal incidence, five conclusions may be noted:

First, the fact that government fiscal programs in 1963 and 1969 provided net gains to all income classes is well supported by the results of this study. Net benefits for the lowest income class were quite pronounced in 1969 under the money income base, much more so than was the case in 1963.

As for the other income classes, the net fiscal incidence pattern was still continuously regressive in 1969 under the money income base. But for 1963, under that income base, the trend turned slightly upward at the highest income bracket, thus making the entire fiscal incidence picture appear somewhat U-shaped rather than generally downward sloping, as in 1969. Under an adjusted income base, however, the net fiscal incidence trends in both years were flattened out, as was true of the tax and expenditure incidence patterns. Although the regressivity remained under an adjusted income base (at least in 1969), this was again barely apparent. (For 1963 the slope of the generalized net fiscal incidence function even turned slightly positive, meaning that the fiscal system was progressive.) This being the case, it would be best to call the fiscal programs of 1963 and 1969 proportional. But of the two, the 1969 fiscal programs offered greater net benefits to all households relative to their income than did the 1963 programs.

Second, the foregoing conclusion that every income class gained absolutely from government tax and expenditure programs is valid only insofar as the budget imbalance, with expenditures exceeding taxes by quite a large amount, is assumed to add to the income of households without any corresponding reduction of real income through possible price increases due to budget deficits. This is known as the post-fisc income distribution under Assumption I. Using Assumption II, that is, if the deficit is eliminated by a hypothetical

collection of a proportional income tax, then there were net gainers and net losers. The pattern of post-fisc income distribution was the same as before the elimination of the budget deficit, only the level of net fiscal incidence was reduced. The pattern of income redistribution became easier to see; any income class with a negative effective fiscal rate was said to have redistributed its income to other income classes with positive effective fiscal rates. In 1963 the top and the bottom income classes were clearly the net gainers, with the three income groups in between the net losers. In 1969, the redistribution was quite clear-cut, with the first four income brackets being the net gainers, and the last three brackets the net losers.

Third, it is possible, and in fact more likely, that the existence of a budget deficit would drive prices up in Thailand. If it is assumed that prices rise to the amount of the deficit, and that the effect is an equal reduction in real income of each household (Assumption III,), then the fiscal programs in 1963 and 1969 would turn mildly progressive. In other words, a budget deficit in an overall fiscal program is very important, and different assumptions about its income distributional impact could yield different net fiscal incidence results.

Fourth, under Assumptions I and II regarding the budget deficit, the 1963 post-fisc income distribution improved over the pre-fisc income distribution of the same year by about 0.8 percent using a money income base, but worsened

by about 0.2 percent under an adjusted income base. In 1969, the post-fisc income distribution improved over the pre-fisc income distribution under both income bases, and the rate of improvement ranged from 2.0 to 4.7 percent. But under Assumption III, the post-fisc income distribution actually became more unequal than the pre-fisc income distribution in both 1963 and 1969. In 1963 the post-fisc distribution worsened by about 2.3 to 3.8 percent, compared to about 0.6 to 1.2 percent in 1969.

Fifth, and most important as a conclusion, the fiscal programs of the government caused very little improvement in the existing income distribution of Thai households. The effects were so minimal that by slightly changing the assumption as to how to allocate the burden of the budget deficit reversed the overall effects from equalizing to de-equalizing income distribution. One brighter note, however, is that the fiscal programs of 1969 were definitely and consistently more income equalizing than those of 1963. This means that the government's impact on income distribution is becoming more favorable as time passes. Yet, the fact remains that the rate of improvement over the six years between 1963 and 1969 was still woefully slow and the magnitude of improvement was small. Also, the income redistributional effects of the government taxes and expenditures in 1969 were still much too inadequate to offset the increased inequality in adjusted income distribution over the previous six years.

Policy Implications

There are many ways in which the government could change the distribution of income of individuals or households. Taxes and public expenditures are merely one instrument of income redistribution, but since this study is concerned only with tax and expenditure incidence, it is appropriate to consider policy implications only in those areas. No doubt the present findings could have implications in other areas, but a discussion of these issues is outside the scope of this research.

On the Tax Side

At least five recommendations may be made concerning changes in taxation policy:

First, the entire Thai tax system is much too regressive. This study has clearly shown how the lower income households have suffered the burdens of regressive taxes relatively more than upper income households. The main aim of any tax reform should be to reduce the regressivity of the tax and revenue structures as much as possible.

Second, and more specifically, reform should be focused on strengthening income or direct taxation in Thailand. An income tax that contributes only 5 to 6 percent of total government revenues is much too low. The main problem is not so much with the tax rate (although present structures could be improved to make the effective rate more progressive),

but with compliance and enforcement. The present tax administration system must be thoroughly streamlined before tax collections can increase.

Third, a system of property and wealth taxation must be instituted. It is difficult to believe that in the face of continuing concentration of wealth among a small but growing number of families, Thailand has no estate, gift, or inheritance taxes. An effective wealth tax, probably both on net wealth as well as transfer tax, would be a most commendable income redistributing agent in addition to an improved income tax system.

Fourth, with increased revenues from direct taxation, the dependence on such indirect taxes as business taxes, selective sales taxes, and certain import duties would diminish. Since these indirect taxes burden the poorer income classes relatively more than the wealthier, less dependence on them would certainly improve income equality.

Finally, certain taxes are singularly burdensome to the poor, such as the rice premiums and state lotteries. The government favors these revenue sources for their convenience in collection, but they should be abolished if the government is truly concerned with improving the present income distribution.

On the Expenditure Side

Four recommendations concerning expenditures seem most important:

First, expenditure programs as a whole are regressive or pro-poor, and this is desirable. But since a budget deficit is probably detrimental to a more equal distribution of income because of inflationary pressure, attempts should be made to have a balanced or near-balanced budget through increased direct taxes and a curtailment of certain expenditure items.

Second, those expenditures which need to be reduced include defense and public administration. The imputed benefits from these general services constituting 40 to 50 percent of all benefits accruing to the poorest households has a dubious meaning at best. The benefits from a large defense and general administrative spending may be overestimated, particularly from the point of view of the poorest households.

Third, for income distribution purposes, there is a need for additional spending in primary education and health and public welfare services. Primary schooling in rural Thailand is very underdeveloped. Considering the ever-present budget constraints, emphasis should be placed more on primary than on secondary and highly subsidized university education. Also, an adequate social welfare program should be instituted. At the very least, the already planned but long delayed social security program should be put into operation.

Fourth, agricultural expenditures should be increased. The government should be more actively involved in agricultural credit and in provisions for guaranteed prices and in developing

market outlets. Thai farmers are probably the segment of the population that deserve to be assisted the most in redistributed efforts.

The foregoing are some policy implications and recommendations stemming from the results of this fiscal incidence study. It is noted again that these policies are confined to the areas of taxes and public expenditures only; there are many other nonbudgetary policies that could conceivably generate a much greater income redistributional impact. Land reform is one example. If a massive land reform were successfully carried out, it would be certain to improve the distribution of income within the country. Thai farmers constitute more than three-quarters of Thailand's population and the majority are in debt.[1] Their indebtedness ranges from a fraction of a norman annual crop yield to many times that amount, and within a few years they will lose the ownership of the land to creditor landlords or money lenders. Many of these farmers are forced into debt through no fault of their own, but because of adverse production and marketing conditions, credit conditions, and the general neglect of the government.

Suggestions for Further Research

This intertemporal study of fiscal incidence in Thailand is by no means satisfactory in every respect. There are undoubtedly several shortcomings in analysis, statistical data, and in misplaced emphasis. Future research should be conducted

with the following possible improvements in mind:

(1) Income and expenditure surveys should be carried out frequently, preferably on an annual basis.

(2) It is to be hoped that household surveys will become much more reliable as the system is regularized and the researchers become more experienced. In these surveys, an emphasis should be placed on perfecting the income elements, including nonmoney income, on consistency in the methods of estimation, and in the presentation of the results.

(3) Tax and expenditure records should be collected with as much disaggregated detail as possible. The analysis should be expanded from a national level to a regional, sectoral and provincial level.

(4) The practice is becoming widespread of studying in detail, the income distributional effects of specific public expenditures such as those for irrigation and public health. This involves much more than simply assuming who the beneficiaries of such expenditures are, and then allocating those expenditures; actual field studies are necessary in which sample surveys are conducted to determine who receives the benefits and how much, using some index of benefit valuation. For example, regarding health expenditures for public hospital operations, income records could be kept of the income groups who come for medical service and the amount of services provided. This method of study is very expensive, of course, but it would provide a much clearer idea of the areas to which the government should reorient its policy for

equity purposes.

(5) If possible, researchers should attempt to incorporate in their studies the income redistributive influences of the non-budgetary policies and external influences such as the effects of foreign aid and loans. Certainly, this is not the work for one or even a few researchers. Perhaps a government body could be established to deal specifically with this problem of evaluating the income redistributional impact of the entire economic structure.

FOOTNOTES

[1]See Uthis Narksaward, Report on the Indebtedness and Marketing Practices of Rice Farmers in the Central Plain of Thailand, B. E. 2510-2511. (Bangkok: National Research Council and United States Operation Mission, 1970).

APPENDICES

APPENDIX A

THE ESTIMATION OF THE NUMBER OF HOUSEHOLDS IN 1963

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THE ESTIMATION OF THE NUMBER OF HOUSEHOLDS IN 1963

1. The population figures by regions taken from the 1960 population census are compared to the population figures by regions taken from the 1970 population and housing census. From the total rate of increase of population in each region over 10 years, the average annual rate of growth is estimated.

2. The population in 1963 by regions and locations is then estimated by raising the 1960 population by three times the average annual growth rate of population. The result is shown in Table A.1.

3. The average numbers per family by regions (also shown in Table A.1) are obtained from the 1962-1963 Household Expenditure Survey, and they were used to divide the population in each corresponding location and region in 1963 to arrive at the number of families by regions.

4. Multiplying these families by the percentage distribution of families by income classes (Table 2.1) and summing up all urban and rural households in all regions resulted in the total number of households, as shown in Table A.2.

Table A.1--Estimated Population in 1963 (Numbers in Thousands)

Regions	Urban	Rural	Total
North	855.1 (5.1)	5,397.7 (5.3)	6,252.8
Central-East	1,126.4 (5.3)	5,731.5 (5.6)	6,857.9
Northeast	776.8 (5.4)	9,124.9 (5.9)	9,901.7
South	595.0 (5.6)	2,976.8 (5.2)	3,571.8
Bangkok	2,115.6 (5.5)	--	2,115.6
Whole Kingdom	5,468.9	23,230.9	28,699.8

Note: Figure in parenthesis is the size of household in that region and location taken from the Reports of the 1962-1963 Household Expenditure Survey published by the National Statistical Office.

Table A.2--Estimated Number of Households in 1963 (Numbers in Thousands of Households)

Income Classes (Baht)	Urban	Rural	Whole Kingdom	
				%
Under 3,000	129.7	2,359.3	2,489.0	48.1
3,000- 5,999	175.2	898.8	1,074.0	20.8
6,000-11,999	336.8	674.1	1,010.9	19.5
12,000-17,999	159.3	141.5	300.8	5.8
18,000-23,999	76.1	49.9	126.0	2.4
24,000-29,999	38.1	12.5	50.6	1.0
30,000-35,999	29.2	8.3	37.5	0.7
36,000-47,999	25.3	8.3	33.6	0.7
48,000-59,999	14.1	4.2	18.3	0.4
60,000 and over	29.2	4.2	33.3	0.6
All Classes	1,013.0	4,161.0	5,174.0	100.0

APPENDIX B

BASIC INFORMATION FOR THE ESTIMATION OF THE DISTRIBUTION OF MONEY INCOME IN 1969

APPENDIX B

BASIC INFORMATION FOR THE ESTIMATION OF THE DISTRIBUTION OF MONEY INCOME IN 1969

Since the basic information for the estimation of the 1969 money income distribution in this study is obtained from the retabulation of the original 1968-1969 socio-economic survey results by Dr. Oey Astra Meesook, the outcome of which differed slightly from the officially published figures, it is necessary that such basic data be provided for the interested reader.

1. Table B.1 shows the number of households in 1969 taken directly from the Report of Population and Housing Census, 1970. Since the census was conducted primarily during 1969, no further adjustment was made to these figures.

2. The distributions of urban and rural households by regions are shown in Table B.2. They provide the weights by which the urban and rural households are subdivided into regions.

3. The distributions of urban and rural households by income classes in each region are available from the 1968-1969 socio-economic survey (Tables B.3 and B.4). With these distributions, the number of urban and rural households by income classes in each region can be estimated.

4. Given the average annual money income by income classes in each region (Tables B.5 and B.6), also available from the 1968-1969 socio-economic survey, the total money income of households by locations, regions, and income classes easily can be computed.

Table B.1--Number of Households in Urban and Rural Areas, 1969

Location	Households (Million)	Percentage
Urban	762.1	12.9
Rural	5,146.4	87.1
Whole Kingdom	5,908.5	100.0

Source: Thailand, National Statistical Office, Report of Population and Housing Census, 1970 (Bangkok, 1974), Table 2.

Table B.2--Percentage Distribution of Urban and Rural Households by Regions, 1969

Region	Urban	Rural
North	11.0	24.9
Central	16.3	23.6
Northeast	10.7	36.4
South	10.8	13.6
Bangkok	51.2	1.5
Total	100.0	100.0

Source: Thailand, National Statistical Office, Report of Socio-Economic Survey, 1968-1969 (Bangkok, 1974), p. 36.

Table B.3--Percentage Distribution of Urban Households by Income Classes, 1969

Income Classes (Baht)	Regions				
	North	Central	Northeast	South	Bangkok
Under 3,000	1.5	1.2	1.4	1.2	0.5
3,000- 5,999	12.5	5.0	3.7	6.4	1.2
6,000- 8,999	12.5	7.4	9.6	13.9	4.4
9,000-11,999	16.5	10.5	13.2	14.5	8.9
12,000-14,999	10.6	14.5	11.5	11.9	10.2
15,000-17,999	8.2	11.1	9.4	10.1	9.8
18,000-23,999	14.8	18.2	19.5	14.0	19.8
24,000-29,999	5.4	12.3	10.3	8.8	12.4
30,000-35,999	5.3	5.3	6.1	5.4	7.9
36,000-47,999	7.1	4.8	4.2	5.1	9.0
48,000-59,999	1.1	3.4	5.0	3.8	5.6
60,000 and over	4.8	6.3	6.2	5.0	10.4
All Classes	100.0	100.0	100.0	100.0	100.0

Source: Results of the retabulation of the original data tapes of the 1968-1969 socio-economic survey by Dr. Oey Astra Meesook of Thammasat University.

Table B.4--Percentage Distribution of Rural Households by Income Classes, 1969

Income Classes (Baht)	Regions				
	North	Central	Northeast	South	Bangkok
Under 3,000	18.4	7.0	52.1	17.2	1.1
3,000- 4,499	19.4	9.7	15.6	19.5	3.1
4,500- 5,999	14.9	9.4	7.3	19.2	5.8
6,000- 7,499	12.3	11.2	5.8	14.2	6.0
7,500- 8,999	8.9	10.6	4.2	8.7	3.2
9,000-10,499	4.9	10.3	4.7	6.2	7.3
10,500-11,999	4.0	6.1	1.1	3.6	6.6
12,000-14,999	7.2	10.2	3.1	3.8	15.3
15,000-17,999	3.8	7.4	1.6	3.0	11.3
18,000-32,999	5.5	12.6	3.4	4.2	24.8
33,000 and over	0.8	5.6	1.1	0.4	15.6
All Classes	100.0	100.0	100.0	100.0	100.0

Source: Results of the retabulation of the original data tapes of the 1968-1969 socio-economic survey by Dr. Oey Astra Meesook of Thammasat University.

Table B.5--Average Urban Annual Money Income, by Income Classes, 1969 (Amounts in Baht)

Income Classes (Baht)	Regions				
	North	Central	Northeast	South	Bangkok
Under 3,000	2,326	1,578	1,617	1,302	1,747
3,000- 5,999	4,503	4,171	4,265	4,522	4,545
6,000- 8,999	7,530	7,526	7,128	7,192	7,429
9,000-11,999	10,144	10,394	10,302	10,302	10,278
12,000-14,999	13,112	13,244	12,899	13,166	13,216
15,000-17,999	16,182	16,066	16,070	16,324	16,186
18,000-23,999	20,196	20,208	20,117	20,313	20,256
24,000-29,999	25,838	25,650	25,639	25,965	26,303
30,000-35,999	32,286	32,327	32,786	31,871	32,169
36,000-47,999	40,295	40,628	40,664	40,033	40,670
48,000-59,999	53,703	52,035	52,865	53,614	52,705
60,000 and over	115,354	101,226	130,291	126,847	117,123
Average	20,955	24,188	26,213	23,233	32,844

Source: Results of the retabulation of the original data tapes of the 1968-1969 socio-economic survey by Dr. Oey Astra Meesook of Thammasat University.

Table B.6--Average Rural Annual Money Income, by Income Classes, 1969 (Amounts in Baht)

Income Classes (Baht)	Regions				
	North	Central	Northeast	South	Bangkok
Under 3,000	2,078	1,832	1,546	2,125	1,732
3,000- 4,499	3,638	3,674	3,622	3,589	3,694
4,500- 5,999	5,125	5,145	5,160	5,082	5,266
6,000- 7,499	6,491	6,665	6,556	6,682	6,743
7,500- 8,999	8,028	8,188	8,164	8,226	8,013
9,000-10,499	9,699	9,618	9,542	9,688	9,708
10,500-11,999	11,245	11,096	11,081	11,044	11,094
12,000-14,999	13,117	13,087	13,104	13,104	13,403
15,000-17,999	16,083	15,881	16,148	16,097	16,215
18,000-32,999	23,470	22,861	23,058	22,386	23,158
33,000 and over	45,947	60,287	131,372[a]	51,946	59,824
Average	7,488	13,009	5,963	6,831	21,488

Source: Results of the retabulation of the original data tapes of the 1968-1969 socio-economic survey by Dr. Oey Astra Meesook of Thammasat University.

[a]Computationally correct figure

APPENDIX C

THE ESTIMATION OF INCOME IN KIND IN 1963

APPENDIX C

THE ESTIMATION OF INCOME IN KIND IN 1963

1. The average income in kind by income classes for 1969 is supplied by Dr. Oey Astra Meesook and is presented in Table C.1.

2. The relationship between "total" income, defined as money income, plus income in kind is established through the following linear regression equation:

$$Y_t = a + bY_m = u,$$

where Y_t is total income, Y_m is money income, a and b are parameters to be estimated, and u is the statistical disturbance. The resulting estimates of parameters in the income in kind functions are shown in Table C.2.

3. After substituting the 1963 average monthly money income of each income class from each region and location into the estimating equation, the average income in kind by income classes, locations, and regions is obtained. This estimation uses the average money incomes supplied by Dr. Meesook, not the midpoint incomes, because it is believed that Dr. Meesook's data provide better income variations among regions. It should be mentioned, however, that both estimated total incomes (that is, money income plus income in kind) using both methods are very close to one another.

4. When the average income in kind is multiplied by the number of households in 1963, the total income in kind for 1963 is obtained, as presented in Table C.3.

Table C.1--The Average Income in Kind, by Locations, by Income Classes, 1969 (Amounts in Baht)

Income Classes (Baht)	Urban	Rural
Under 3,000	1,398	2,826
3,000- 5,999	1,221	4,418
6,000- 8,999	742	4,462
9,000-11,999	829	3,851
12,000-14,999	957	2,030
15,000-17,999	1,193	2,202
18,000 and over	8,927	5,140

Source: Basic data supplied by Dr. Oey Astra Meesook of Thammasat University.

Table C.2--The Estimated Income in Kind Regression Functions ($Y_t = a + bY_m + u$)

Locations and Regions	Intercept	Slope	R^2
Urban			
North	952 (6.65)	.9929 (161.59)	.9995
Central	927 (4.64)	1.0130 (137.55)	.9995
Northeast	913 (2.65)	1.0247 (93.34)	.9998
South	777 (6.80)	1.0234 (234.13)	.9997
Bangkok	911 (14.56)	1.0063 (693.43)	1.0000
Rural			
North	1,776 (12.96)	1.0248 (49.65)	.9907
Central	1,876 (34.35)	1.0146 (300.10)	.9999
Northeast	3,477 (63.47)	0.9719 (67.70)	.9988
South	1,271 (17.74)	1.0520 (86.51)	.9983
Bangkok	657 (4.53)	1.0286 (214.73)	.9999

Source: Results supplied by Dr. Oey Astra Meesook of Thammasat University.

Note: Figures in parentheses are t-statistics.

Table C.3--Total Income in Kind, 1963 (Amounts in Millions of Baht)

Locations and Regions	Income Classes (Baht)					All Classes
	Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000 and over	
Urban						
North	52.3	30.5	40.1	14.6	10.7	148.2
Central	12.5	26.5	59.6	28.0	50.0	176.7
East	6.9	9.9	21.0	8.9	12.2	59.0
Northeast	24.6	30.0	53.7	27.7	41.8	177.7
South	8.8	16.2	35.4	24.5	28.9	113.7
Bangkok	18.1	57.9	127.7	76.4	166.9	447.0
Rural						
North	1,189.5	387.3	257.2	46.1	19.9	1,900.0
Central	415.0	507.8	442.6	118.2	87.0	1,570.6
East	157.8	129.2	129.6	34.4	13.9	464.9
Northeast	4,159.9	580.3	410.9	60.7	36.1	5,247.9
South	272.0	293.5	231.0	53.3	54.1	903.9
Whole Kingdom	6,317.4	2,069.1	1,808.8	492.9	521.5	11,209.6

APPENDIX D

DISTRIBUTIVE SERIES FOR USE AS TAX AND EXPENDITURE ALLOCATION BASES

APPENDIX D

DISTRIBUTIVE SERIES FOR USE AS TAX AND EXPENDITURE ALLOCATION BASES

This appendix describes how each allocation base from the distributive series table was obtained. This information will enable the interested reader to retrace the steps taken in estimating the final tax and expenditure incidence in this study.

Tables D.1 and D.2

Base B1-B8: For 1963 these distributions of household expenditures are computed by multiplying the average monthly expenditures by families on eight commodity groups (shown in Tables 4.3 and 4.4 in the 1962-1963 Household Expenditure Survey) by the number of households in the corresponding income brackets (see Appendix A). The eight commodity groups are listed in greater detail as follows: (1) food purchased and prepared at home as well as food consumed away from home; (2) housing, furnishing, and household operations; (3) clothing and materials; (4) transportation; (5) reading, recreation, and education; (6) medical and personal care; (7) tobacco and alcoholic drinks; and (8) gifts and contributions, taxes, and miscellaneous household expenses.

The percentage share of expenditures of each income class in each commodity group is then computed from the total

Table D.1--Distributive Series, 1963 (Percentages)

Table D.1--Distributive Series, 1963 (Percentages)

Base	Distributions	Income Classes (Baht)					All Classes
		Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000 and over	
1	Food Exp.	30.3	18.3	24.9	10.7	15.8	100.0
2	Housing Exp.	23.2	15.9	24.3	13.2	23.3	100.0
3	Clothing Exp.	27.0	17.3	26.5	11.8	17.4	100.0
4	Transportation Exp.	15.8	12.3	20.5	15.2	36.2	100.0
5	Recreation Exp.	12.4	12.5	25.5	18.2	31.4	100.0
6	Medical Care Exp.	26.8	18.6	25.3	11.6	17.7	100.0
7	Tobacco Exp.	24.8	17.9	26.9	12.4	18.0	100.0
8	Miscellaneous Exp.	29.1	15.0	21.6	11.5	22.9	100.0
9	Total Exp.	26.9	17.0	24.7	11.9	19.5	100.0
10	Total Non-food Exp.	24.3	15.9	24.3	12.7	22.8	100.0
11	Total Household	48.1	20.8	19.5	5.8	5.8	100.0
12	Urban Household	12.8	17.3	33.3	15.7	20.9	100.0
13	Rural Household	56.7	21.6	16.2	3.4	2.1	100.0
14	Top Income Group	0.0	0.0	0.0	0.0	100.0	100.0
15	Total Income	13.0	14.0	26.4	13.1	33.5	100.0
16	Urban Income	1.5	5.2	19.8	15.6	57.9	100.0
17	Rural Income	22.1	21.1	31.6	11.0	14.2	100.0
18	Reciprocal of Income	26.3	24.4	13.0	26.1	10.2	100.0
19	Income of Rubber Growers	5.6	13.6	26.9	16.9	37.0	100.0
20	University Students	0.4	0.5	7.4	8.2	83.5	100.0
21	Goverment Officials	0.0	1.8	66.3	12.5	19.4	100.0
22	Government Pensioners	0.0	0.0	67.5	12.7	19.7	100.0
23	Individual Income Tax	0.0	0.0	0.0	3.0	97.0	100.0

Table D.2--Distributive Series, 1969 (Percentages)

Base	Distributions	Income Classes (Baht)							All Classes
		Under 3,000	3,000-5,999	6,000-8,999	9,000-11,999	12,000-14,999	15,000-17,999	18,000- and over	
1	Food Exp.	7.1	12.6	13.5	11.6	9.5	7.6	38.1	100.0
2	Housing Exp.	6.1	10.9	11.8	9.8	9.2	7.2	45.0	100.0
3	Clothing Exp.	7.3	13.0	13.3	11.3	9.4	6.9	38.7	100.0
4	Transportation Exp.	3.5	7.9	11.6	9.7	9.1	7.0	51.2	100.0
5	Recreation	2.5	6.2	7.8	7.5	9.8	8.0	58.2	100.0
6	Medical Care Exp.	7.7	15.2	14.8	11.5	9.2	6.9	34.7	100.0
7	Tobacco Exp.	7.0	11.8	13.2	10.9	9.8	8.3	39.0	100.0
8	Miscellaneous Exp.	5.5	9.2	8.2	8.3	9.7	7.6	51.5	100.0
9	Total Exp.	6.5	11.8	12.6	10.8	9.4	7.5	41.4	100.0
10	Total Non-food Exp.	6.0	10.7	11.7	10.0	9.4	7.4	44.8	100.0
11	Total Household	24.1	23.8	16.0	9.9	6.8	4.6	14.8	100.0
12	Urban Household	0.9	3.9	7.3	11.0	11.3	9.8	55.8	100.0
13	Rural Household	27.5	26.8	17.3	9.8	6.1	3.8	8.7	100.0
14	Top Income Group	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0
15	Total Income	3.7	9.3	10.6	9.2	8.1	6.8	52.3	100.0
16	Urban Income	0.1	0.6	1.9	4.0	5.2	5.6	82.6	100.0
17	Rural Income	5.6	13.6	15.0	11.9	9.5	7.4	37.0	100.0
18	Reciprocal of Income	30.8	12.4	10.8	12.5	14.2	17.0	2.2	100.0
19	Income of Rubber Growers	6.8	23.4	20.6	12.1	7.6	4.5	25.0	100.0
20	University Students	0.4	0.5	3.7	3.7	4.1	4.1	83.5	100.0
21	Government Officials	0.1	0.0	14.2	24.2	17.5	11.4	32.6	100.0
22	Government Pensioners	0.0	0.0	14.2	24.2	17.5	11.4	32.7	100.0
23	Individual Income Tax	0.0	0.0	0.0	0.3	1.2	2.1	96.4	100.0

Table D.3--Total Household Expenditures, 1963 (Amounts in Millions of Baht)

Commodity Groups	Income Classes (Baht)					All Classes
	Under 3,000	3,000-5,999	6,000-11,999	12,000-17,999	18,000- and over	
Food	5,080.8	3,067.2	4,184.4	1,802.4	2,648.4	16,782.0
Housing	1,208.4	829.2	1,267.2	690.0	1,214.4	5,208.0
Clothing	1,807.2	1,156.8	1,770.0	786.0	1,160.4	6,680.4
Transportation	279.6	217.2	361.2	267.6	638.4	1,762.8
Recreation	225.6	226.8	465.6	331.2	572.4	1,822.8
Medical Care	784.8	542.4	740.4	338.4	517.2	2,923.2
Tobacco	434.4	314.4	472.8	218.4	315.6	1,755.6
Miscellaneous	1,299.6	669.6	966.0	512.4	1,022.4	4,470.0
Total Expenditures	11,120.4	7,023.6	10,226.4	4,945.2	8,089.2	41,406.0

Table D.4--Total Household Expenditures, 1969 (Amounts in Millions of Baht)

Commodity Groups	Income Classes (Baht)							All Classes
	Under 3,000	3,000-5,999	6,000-8,999	9,000-11,999	12,000-14,999	15,000-17,999	18,000 and over	
Food	2,012,3	3,558.4	3,792.3	3,285.5	2,670.0	2,139.4	10,735.5	28,193.3
Housing	362.3	648.6	703.2	580.6	544.1	430.9	2,679.3	5,949.0
Clothing	466.0	827.5	849.2	721.4	596.0	440.2	2,466.3	6,366.6
Transportation	120.8	274.8	402.1	335.6	314.4	242.1	1,776.1	3,465.9
Recreation	63.7	159.7	198.9	192.8	251.1	204.9	1,492.3	2,563.4
Medical Care	310.0	607.9	591.1	461.8	369.6	277.8	1,390.1	4,008.1
Tobacco	221.4	371.3	417.7	342.1	307.7	261.0	1,232.2	3,153.4
Miscellaneous	262.2	441.4	392.5	395.8	464.1	366.7	2,469.4	4,792.1
Total Expenditures	3,818.7	6,890.1	7,347.0	6,315.5	5,517.0	4,362.8	24,240.8	58,491.8

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(annual) expenditures, as shown in Table D.3. For 1969, exactly the same procedure is used. The average monthly household expenditures for eight commodity groups are given in Table 4 in the Report of the 1968-1969 Socio-Economic Survey, and the number of households in 1969 in given in Table 2.6 in the text. Table D.4 shows total expenditures in 1969.

Base B9: The distribution of total household expenditures is estimated by multiplying the average total expenditures, by locations, by income classes (also shown in Tables 4.3 and 4.4 in the Report of the 1962-1963 Household Expenditure Survey: Whole Kingdom) by the corresponding numbers of households (Table A.2).

Base B10: The distribution of nonfood expenditures is obtained from the total household expenditures after the total food expenditures by income classes are subtracted.

Base B11-B13: For 1963, the distribution of urban, rural, and total households is obtained from Appendix A; for 1969, it is obtained from Tables 2.4 to 2.6 in the text.

Base B14: This distribution is used in cases where the incidence is assumed to fall entirely on the top or the highest income group.

Base B15-B17: For both 1963 and 1969, the distributions of urban, rural, and total money income are obtained from Tables 2.3, 2.4, and 2.5 in the text.

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Base B18: The total money income in each income class for 1963 and 1969 is reciprocated. The share of the reciprocated sum by each income class is then estimated to give this distribution.

Base B19: The 1963 Agricultural Census conducted by the National Statistical Office contains information on the production of rubber by size of holdings and also the total number of rubber growing households by size of holdings. This enables one to compute the total volume of rubber production by size of holdings for 1963. The average rubber price is then used to convert it to total income by size of holdings. The average income of rubber growers is then adjusted to fit into the income class classification for 1963. For 1969, it is assumed that the distribution of income of rubber growers remains the same as in 1963, so the 1963 distributional pattern is used.

Base B20: The distribution of university students by income classes for 1963 and 1969 is obtained from the report entitled General Facts about First-Year Students at Thammasat University, 1972-1973, published by Thammasat University. It is assumed, first, that the distribution of Thammasat students is representative of all other university students with respect to the overall income positions of their parents and, second, that the pattern of distribution for 1973-1974 is the same for 1963 and 1969. This second

assumption tends to bias in favor of the lower income classes because the current pattern is for these lower income classes to be able to attend universities which they could not attend ten years ago. But this bias should not unduly affect the pattern of benefits received since expenditures for higher education are quite small.

Base B21-B22: The distribution of government officials by size of salaries was obtained directly from the State Service Commission and the Department of Comptroller General. For distribution in 1969, one might notice a small percentage share in the lowest income class. This was the result of the program set up by the Department of Local Government to hire some villagers to perform the duty of village militiamen, for which each was paid a small fee. Thus the distribution of government pensioners was estimated simply by deleting the number of official households in the lowest salary bracket. It is recognized that officials do move up the income scale when they retire, but most remain in the middle income brackets because the promotion system in the Thai bureaucracy is, by and large, extremely slow. It is possible to obtain the actual distribution of goverment pensioners for 1963 and 1969 by reconstructing data from the Department of the Comptroller General, but it was decided that this was not worth the time and effort.

Base B23: This distribution in fact shows the percentage of income tax that has been paid by households in

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various income brackets. For 1969 the statistics on individual income tax returns by size of taxable income are presented in the 1969 annual report of the Department of Revenue. These taxable income brackets have been rearranged to fit into the income class classification used in this study. For 1963, there are no similar statistics, so it is assumed that the pattern of income tax burden for 1963 is approximately the same as for 1969.

APPENDIX E

DISAGGREGATED TAX DATA

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APPENDIX E

DISAGGREGATED TAX DATA

Table E.1--Disaggregated Taxes and Other Revenues, 1963 and 1969 (Amounts in Millions of Baht)

Tax and Revenue Categories	Year	
	1963	1969
1. Individual income tax	468.2	1,119.5
2. Corporate income tax classified by the following types of business activities:	312.2	851.1
2.1 Agriculture, forestry, fishery	2.4	2.7
2.2 Mining	40.6	17.2
2.3 Construction and repair	5.7	20.5
2.4 Manufacturing	81.7	291.7
Food	1.6	47.4
Softdrink and beer	11.2	--
Alcoholic drinks	7.3	14.8
Cement and cement products	36.2	59.9
Wood products	--	21.5
Cosmetic and leather products	--	53.7
Glass	7.0	10.7
Other	18.4	83.6
2.5 Public Utilities and Transport	17.7	38.9
Public transport	16.5	38.1
Water and light	1.2	0.8
2.6 Commerce	97.4	306.9
Export-import	31.2	80.1
Hardware and dep't stores	--	80.6
Other	50.7	146.2
2.7 Banking, insurance, real estate	31.6	79.7

Table E.1--continued

Tax and Revenue Categories	Year 1963	1969
2.8 Other services	32.2	33.3
Service stations	19.6	--
Other	12.6	--
2.9 Other miscellaneous	2.7	60.2
3. Selective sales taxes	400.5	2,521.1
Entertainment taxes	47.6	85.6
Liquor	194.4	299.7
Beer	41.5	190.7
Non-alcoholic beverages	42.5	126.5
Matches	20.8	24.2
Tobacco	30.0	738.5
Cement	16.5	45.2
Snuff	6.6	10.8
Oil and fuel	--	999.7
Other	0.5	0.1
4. Business taxes	1,561.3	3,490.5
4.1 Sales type A	928.3[a]	1,622.3
List 1		1,393.4
Food, drinks, and tobacco		473.0
Clothing		105.1
Cosmetics and medicine		115.2
Building materials and stationery		221.6
Household tools and utensils		40.8
Motor vehicles		61.1
Fuel, oil, and petroleum products		235.3
Sundry goods		84.8
Miscellaneous		56.5
List 2		134.0
Food		2.4
Household goods		22.0
Machinery		5.2
Other		104.4

Table E.1--continued

Tax and Revenue Categories		Year 1963	Year 1969
List 3			94.9
	Upland crop export		94.9
4.2	Sales type B	265.0	663.9
	Refrigerators, air conditioners	18.6	8.0
	Electrical appliances	0.6	36.0
	Passenger cars	15.1	144.9
	Liquor	79.2	308.2
	Painted material	1.9	3.8
	Gold and jewelry	7.2	14.0
	Tin and rubber exports	126.6	135.4
	Other (food)	15.8	13.6
4.3	Rice and saw milling	124.9	223.7
4.4	Contractor and services	89.0	439.1
	Printing	4.2	14.0
	Photographic shops	2.5	4.2
	Civil construction	33.4	247.5
	Advertising	1.9	14.7
	Barbershops, beauty salons	1.7	4.5
	Other	45.3	154.3
4.5	Rental services	3.0	17.1
4.6	Storage services	0.8	3.1
4.7	Hotels and restaurants	49.6	135.4
	Nightclubs	5.2	12.6
	Hotels	13.6	57.9
	Restaurants	30.8	64.9
4.8	Transport services	14.4	48.9
4.9	Pawnshops	3.0	8.0
4.10	Underwriters, auctioneers	37.5	68.8
4.11	Real estate agencies	0.9	32.1

Table E.1--continued

Tax and Revenue Categories	Year 1963	Year 1969
4.12 Banking and insurance	39.0	204.5
4.13 Net detail given	--	22.3
4.14 Other	5.9	1.3
5. Import duties	2,764.3	5,294.0
5.1 Food	247.1	369.5
5.2 Drinks and tobacco	116.3	280.2
5.3 Raw materials	19.0	57.3
Wood fiber	0.7	5.6
Clothing fiber	4.8	20.9
Fertilizer	5.7	13.7
Metal and other raw materials	7.7	17.1
5.4 Fuel, oil, and petroleum products	661.4	434.3
5.5 Animal and vegetable fats	3.5	8.3
5.6 Chemical products	236.9	570.4
Chemical compounds	49.1	100.4
Dye	35.0	74.3
Pharmaseutical products	42.0	68.1
Perfumes	51.9	101.1
Other	58.9	226.4
5.7 Manufactured goods	732.0	1,512.8
Clothes	396.7	625.1
Leather products	1.6	6.3
Wood and cork products	2.0	6.2
Rubber products	77.6	115.3
Paper	40.1	186.3
Non-metallic products	38.0	82.9
Silver and alloys	3.8	9.0
Other metal products	172.2	481.6

Table E.1--continued

Tax and Revenue Categories	Year 1963	1969
5.8 Machinery and transport equipment	597.0	1,675.4
Heavy machinery	182.5	450.8
Electrical generators	130.4	376.9
Transport equipment	284.1	847.8
5.9 Miscellaneous manufactured goods	139.6	362.2
Household fixtures	11.8	23.6
Furniture	3.4	8.7
Travel goods	1.9	5.9
Clothing	28.8	55.9
Shoes	2.7	7.6
Scientific equipment, films, and watches	32.5	88.2
Other	58.6	172.4
5.10 Others not included elsewhere	11.5	23.6
6. Rice premiums	798.4	1,235.6
7. Other export taxes	363.2	424.3
Rice	154.5	157.4
Rubber	187.0	227.9
Wood	9.4	19.9
Rawhide	4.7	1.1
Other	7.6	18.0
8. Taxes on property	147.4	390.1
Motor vehicles and automobiles	88.6	214.7
Immovable property registration	58.8	175.5
9. Royalties and permits	422.0	691.9
9.1 Royalties	173.3	354.1
Bird's nest	1.1	2.3
Fishery	6.0	3.5
Wood	5.0	6.8
Other forest products	39.0	46.5
Tin	122.3	294.9

Table E.1--continued

Tax and Revenue Categories	Year	
	1963	1969
9.2 Permits	248.7	337.7
Radio	0.5	0.5
Liquor sale	3.1	2.0
Other excise	3.4	8.1
Forest	1.6	7.3
Rubber	20.7	8.4
Alien registration	83.2	63.5
Lottery sale	75.0	118.1
Gambling	48.5	106.9
Gun and fireworks	8.6	14.1
Civil	2.9	4.2
Health	1.3	4.8
10. Government sales and services	322.0	316.1
10.1 Estate sale	0.8	0.3
10.2 National products sale	6.9	5.5
Fuel and oil	5.5	0.4
Wood products	0.7	3.5
Agricultural products	0.6	1.7
10.3 Public utilities	28.1	--
10.4 Books and documents	0.3	0.6
10.5 Other sales	13.1	43.0
10.6 Services (fees)	221.3	204.8
Customs	6.0	5.7
Animal epidemic control	6.8	5.6
Watergate	8.7	10.8
Land and water transport	7.1	24.7
Fishing	0.6	0.4
Forest conservation	39.0	57.5
Airport tax	6.1	14.3
Vehicles	5.0	11.0
Land fees	3.3	6.2
Mineral fees	0.5	1.1
Weighting fees	7.8	16.3
Others	130.4	51.3

Table E.1--continued

Tax and Revenue Categories	Year 1963	1969
10.7 Rents	51.6	61.6
11. Government monopolies	776.1	605.3
Contributions from tobacco monopoly	733.8	450.0
Lottery Bureau	40.8	149.7
Other	1.5	5.5
12. State enterprises	226.3	636.4
13. Other Revenues	245.4	949.3
13.1 Fines and surcharges	110.7	152.9
Surcharges	32.5	51.2
Liquor fines	42.2	32.1
Tax fines	6.2	6.1
Other fines	29.8	63.4
13.2 Returned funds	39.4	603.2
13.3 Miscellaneous	99.2	193.2
Interest	5.2	23.7
Mint receipts	47.8	61.0
Other	46.2	108.5
TOTAL	8,807.3	18,525.2

Sources: Compiled from the following publications: Department of Revenue: (1) Annual Report, 1969, (2) Corporate Tax Statistics, 1963 and 1968, (3) Business Taxes Statistics, 1962 and 1969; Budget Bureau: (1) Annual Budget, 1965 and 1971, (2) Government Receipts, 1963 and 1969; Department of Comptroller General, Report of Receipts and Outlays of the Kingdom of Thailand, 1963 and 1969.

Note: Disaggregated figures for corporate and business taxes are adjusted from the only partially complete data available from the Department of Revenue.

[a]Details are too fragmented to be presented here.

APPENDIX F

DISAGGREGATED PUBLIC EXPENDITURE DATA

APPENDIX F

DISAGGREGATED PUBLIC EXPENDITURE DATA

Table F.1--Disaggregated Public Expenditures, 1963 and 1969
(Amounts in Millions of Baht)

Expenditure Categories	Year	
	1963	1969
1. Economic Services	2,560.1	5,962.4
1.1 Agriculture	776.7	2,222.6
General irrigation services	64.9	234.2
Canals and maintenance	88.5	257.7
State irrigation construction	63.7	664.0
General irrigation construction	55.3	245.6
Chao Phya Development Scheme	65.1	--
Big dam construction	213.6	152.2
OUS: M. Agricultural	6.5	35.2
D. Agricultural	41.3	78.6
D. Rice	33.9	46.0
D. Fishery	26.6	66.2
D. Livestock	36.9	74.4
D. Forestry	72.6	184.7
D. Agricultural Extension	--	80.8
Rubber Organization	7.7	8.0
Rubber Growing Support Fund	--	15.0
Farmers' Assistance Fund	--	80.0
1.2 Power and Fuels	271.8	286.1
Atomic Power for Peace Office	3.0	6.3
National Power Commission	29.7	103.5
Provincial Electricity Authority	49.6	45.1
Northeast Electricity Authority	--	22.5
Lignite Authority	36.6	11.3
Yankee Electricity Authority	67.8	--
Refinery I (Fang)	19.1	11.7
Refinery II (Bangchak)	3.0	85.6
Metropolitan Electricity Authority	63.0	--

Table F.1--continued

Expenditure Categories	Year	
	1963	1969
1.3 Industries	179.3	173.1
OUS: M. Industries	2.4	7.2
D. Industrial Promotion	3.4	17.3
D. Industrial Works	1.3	14.0
Frozen Food Organization	7.0	6.9
Tannery Organization	0.6	--
Textile Organization	41.2	--
Glass Organization	7.9	--
Thai Paper Factory	0.5	--
D. Mineral Resources	38.2	73.3
Board of Investment	--	3.1
Jute Mills	--	12.0
Tin Buffer Stock	--	37.5
Sugar Office	--	1.5
Battery Organization	2.5	--
Preserved Food Organization	41.0	--
Ceramic Factory	0.3	--
Thai Rubber Company	3.0	--
Sugar Industry Company	30.0	--
1.4 Transportation and Communication	1,079.3	2,959.8
OUS: M. Communication	26.1	24.3
D. Land Transport	88.7	19.2
D. Civil Aviation	--	198.8
D. Harbor	6.7	36.5
D. Post and Telegraph	95.0	59.0
D. Highways	758.6	2,550.9
Port Authority	24.6	21.9
State Railways	32.3	46.4
Telephone Authority	34.0	--
Express Transport Organization	9.0	--
Thai Shipping Company	2.6	--
Thai Television Company	1.0	--
Bangkok Dock Company	--	2.6
Thai Airways	0.7	--
1.5 Other Economic Services	253.1	320.8
OUS: M. National Development	24.6	39.9

Table F.1--continued

Expenditure Categories	Year 1963	1969
D. Soil Development	--	53.3
D. Credit and Marketing Co-operatives	6.7	8.1
D. Co-operative Auditing	5.3	7.3
Board of Export Promotion	0.9	1.6
Tourist Organization	6.0	10.3
Fish Marketing Organization	--	0.2
D. Land Co-operatives	50.0	60.2
Bank of Agricultural and Agricultural Co-operatives	--	140.0
National Economic Promotion Company	146.0	--
Union Hotel Company	13.6	--
2. Educational Services	1,777.5	3,674.3
2.1 Primary Education	1,024.7	1,997.9
D. Primary Education	1,024.7	208.6
Grants to Provincial Administrations	--	1,789.3
2.2 Secondary Education	234.9	405.0
D. Secondary Education	234.9	405.0
2.3 Higher Education	193.8	559.6
Chulalongkorn	42.8	108.0
Thammasat	14.2	25.8
Kasetsant	18.7	66.1
Mahidol	112.8	170.4
Chiengmai	--	71.0
Silpakorn	5.4	23.0
Khonkaen	--	29.0
NIDA	--	15.4
Songkhla	--	51.0
2.4 Vocational Education and Other	324.0	711.6
D. Vocational Education	115.1	406.7
D. Physical Education	21.8	12.5
OUS: M. Education	76.2	68.5

Table F.1--continued

Expenditure Categories	Year 1963	1969
Royal Institute	0.5	0.6
National Education Council	1.0	9.2
D. Teacher Training	63.2	158.1
D. Educational Techniques	8.8	4.3
D. Fine Arts	29.1	26.8
National Research Council	8.3	18.8
National Sport Promotion Organization	--	6.1
3. Health and Social Welfare	929.3	2,338.0
3.1 Public Health	305.3	619.2
OUS: M. Public Health	24.1	27.7
D. Medicine	153.4	317.0
D. Health	120.1	266.5
D. Medical Science	7.6	8.1
3.2 Public Welfare	443.6	747.8
D. Public Welfare	73.3	170.8
D. Religious Affairs	15.4	24.8
D. Labor	--	16.8
Government Pawn Shops	8.0	--
Government Pensions	347.0	535.3
3.3 Other Social Services	180.4	971.0
D. Public Works	143.8	432.3
Metropolitan Water Work	--	165.4
D. Community Development	25.1	84.4
D. Science	6.9	11.1
Zoo Organization	1.0	1.1
Town Planning Office	3.7	12.1
Accelerated Rural Development Office	--	264.6
4. General Services		
4.1 Defense	1,637.6	3,718.9
M. Defense	1,637.2	3,716.8
National Security Council	0.4	2.1

Table F.1--continued

Expenditure Categories	Year	
	1963	1969
4.2 Law Enforcement	797.9	1,558.4
M. Justice	66.3	82.2
D. Correction	95.8	153.0
D. Public Prosecution	24.4	33.6
D. Police	611.3	1,289.6
4.3 Public Administration	1,414.6	3,063.8
OUS: Prime Minister's Office	3.8	5.4
Office of the Prime Minister	44.4	28.7
Budget Bureau	3.2	10.8
Office of the Cabinet Secretariat	3.5	5.4
Tax Supervision Office	5.5	10.2
National Economic Development Board	116.2	7.8
Office of Judicial Council	2.0	2.8
State Service Commission	25.4	44.7
Audit Office	10.9	16.4
National Statistical Office	10.7	32.9
D. Public Relations	35.9	47.6
D. Central Intelligence	7.9	16.5
D. Meteorology	6.3	18.1
OUS: M. Economic Affairs	7.6	16.0
D. Internal Trade	2.8	6.0
D. Foreign Trade	3.2	5.0
D. Business Intelligence	2.5	5.4
D. Trade Registration	3.7	5.3
D. Economic Relations	13.5	9.7
OUS: M. Interior	46.5	47.4
D. Land	42.3	85.8
D. Local Government	429.6	917.6
OUS: M. Finance	47.9	340.0
D. Treasury	57.7	54.8
D. Comptroller-General	22.7	33.9
D. Customs	38.6	69.5
D. Excise	49.1	63.6
D. Revenue	62.2	103.9
M. Foreign Affairs	86.9	139.3
D. Technical and Economic Co-operation	53.9	445.9
Royal Household Office	26.9	50.1

Table F.1--continued

Expenditure Categories	Year 1963	1969
Royal Privy Council	0.6	1.2
Parliament Secretariat	14.6	24.9
Postal Charges	3.5	8.0
Foreign Training	3.0	0.5
Foreign Conferences	14.4	17.3
Government Official Assistance Fund	101.8	297.2
Phones and Television Charges	3.6	11.0
Office of Fiscal Policy	--	57.3
4.4 Other	172.1	795.1
Reserve Fund	172.1	762.7
Counterpart Fund	--	32.5
5. Payments on Public Debt	1,139.4	1,245.5
5.1 Repayments	763.7	217.6
5.2 Interest and Management Fees	375.8	1,027.9
TOTAL	10,502.5	22,904.3

Sources: Compiled from the following publications: National Statistical Office, Statistical Yearbook of Thailand, 1965 and 1971; Department of Comptroller General, Report of Receipts and Outlays of the Kingdom of Thailand, 1963 and 1969.

Note: OUS = Office of the Under-Secretary
M = Ministry
D = Department

APPENDIX G

THE LORENZ FUNCTIONS OF VARIOUS DISTRIBUTIONS OF INCOME

APPENDIX G

THE LORENZ FUNCTIONS OF VARIOUS DISTRIBUTIONS OF INCOME

As noted in Chapter 2, a part of the main procedure in this study was to estimate the Lorenz (curve) functions that would fit the pre-fisc, post-tax, post-benefit, post-fisc, and a few other variations of income distributions for 1963 and 1969 so that the exact Gini concentration ratios for both years could be estimated. This method was adopted from N. P. Kakwani and N. Podder as presented in "Efficiency Estimation of the Lorenz Curve and Associated Inequality Measures from Grouped Observations," World Bank Development Research Center Discussion Paper No. 10, October 1974 (mimeographed). The function of the desired Lorenz curve is a double-log regression equation of the following form:

$$\log\left(\frac{p-q}{\sqrt{2}}\right) = a' + \alpha \log\left(\frac{p+q}{\sqrt{2}}\right) + \beta \log\left(\sqrt{2} - \frac{p+q}{\sqrt{2}}\right) + u,$$

where p and q are the cumulative proportions of households and income by income classes, respectively; a', α, and β are the parameters to be estimated; and u is the stochastic disturbance term. The ordinary least-squares method is used to obtain various Lorenz functions. The parameter values and the resulting Gini coefficients (G) are presented in Tables G.1 and G.2.

Table G.1--Lorenz Functions of Various Distributions of Income, 1963

Distributions of Income	a'	α	β	$\bar{R}^2$	G
Pre-Fisc: Money	-.2238 (-57.95)	1.0281 (58.16)	.9817 (477.71)	1.0000	.5627
Pre-Fisc: Adjusted	-.2692 (-38.30)	1.2677 (34.60)	.9793 (250.86)	1.0000	.4559
Post-Tax: Money	-.2021 (-51.98)	.9538 (56.70)	.9842 (484.73)	1.0000	.6102
Post-Tax: Adjusted	-.2650 (-37.90)	1.2654 (34.87)	.9803 (252.95)	1.0000	.4605
Post-Benefit: Money	-.2359 (-50.00)	1.0888 (48.55)	.9809 (385.79)	1.0000	.5304
Post-Benefit: Adjusted	-.2709 (-37.61)	1.2747 (33.83)	.9792 (244.45)	1.0000	.4529
Post-Fisc: Money (Assumptions I & II)	-.2218 (-47.90)	1.0465 (49.07)	.9828 (398.40)	1.0000	.5581
Post-Fisc: Adjusted (Assumptions I & II)	-.2674 (-37.15)	1.2734 (33.95)	.9800 (245.31)	1.0000	.4566
Post-Fisc: Money (Assumption III)	-.2092 (-48.86)	1.0110 (52.80)	.9846 (436.42)	1.0000	.5838
Post-Fisc: Adjusted (Assumption III)	-.2610 (-37.96)	1.2579 (35.47)	.9810 (258.09)	1.0000	.4660

Note: Figures in parentheses are t-values.

Table G.2--Lorenz Functions of Various Distributions of Income, 1969

Distributions of Income	a'	α	β	$\bar{R}^2$	G
Pre-Fisc: Money	-.2400 (-125.69)	.9775 (836.38)	.9760 (849.34)	1.0000	.5550
Pre-Fisc: Adjusted	-.3082 (-28.90)	.9616 (147.62)	.9581 (148.49)	.9998	.4822
Post-Tax: Money	-.2147 (-58.41)	.9834 (436.66)	.9825 (445.03)	1.0000	.5847
Post-Tax: Adjusted	-.3085 (-26.99)	.9616 (137.74)	.9579 (138.54)	.9998	.4819
Post-Benefit: Money	-.2617 (-77.33)	1.0156 (102.27)	.9720 (552.29)	1.0000	.5151
Post-Benefit: Adjusted	-.2972 (-26.92)	1.0456 (31.09)	.9644 (165.17)	.9998	.4738
Post-Fisc: Money (Assumptions I & II)	-.2536 (-72.11)	1.0144 (98.97)	.9740 (534.58)	1.0000	.5289
Post-Fisc: Adjusted (Assumptions I & II)	-.2977	1.0487	.9644	.9998	.4725
Post-Fisc: Money (Assumption III)	-.2328 (-92.95)	.9860 (138.99)	.9780 (762.41)	1.0000	.5614
Post-Fisc: Adjusted (Assumption III)	-.2881 (-24.55)	1.0368 (29.28)	.9663 (156.30)	.9999	.4853

Note: Figures in parentheses are t-values.

APPENDIX H

THE NET FISCAL INCIDENCE BASED ON AARON-MCGUIRE-MAITAL METHOD

APPENDIX H

THE NET FISCAL INCIDENCE BASED ON AARON-MCGUIRE-MAITAL METHOD

Dissatisfied with the arbitrary ways in which public expenditures were allocated among income classes in most fiscal incidence studies, Henry Aaron and Martin McGuire proposed a theory indicating the proper way in which such public good expenditures should be allocated.[1] Essentially, they contend that the imputed benefits of public goods provided by the public sector accruing to each family should be determined by some value of private good benefits received by that particular household. A brief description of the Aaron-McGuire theory is given below.

In a neoclassical framework of efficient consumption, Aaron and McGuire assume that a utility function for each family is known or can be determined and is a function of the value of private goods and pure public goods in the form

$$U^i = f[(Y_D^i + Y_S^i), P],$$

where U^i is the utility of family i; $(Y_D^i + Y_S^i)$ is the summation of disposable income of and the benefits from specific good expenditures received by family i (together, it is the estimated value of private goods consumed by family i alone); and P is the amount of public goods. A public good, P, has all the characteristics well known in the literature, for example, it

is consumed in equal amounts by all, consumption by one has no effect on consumption by others, and no one can be excluded from enjoying it. Aaron and McGuire also assume that the utilities of public goods and other goods are independent.

For any two families a and b, the optimal or efficient condition for consumption is attained when the marginal rate of substitution of total private goods and public goods of family a is equal to the similar marginal rate of substitution of family b, that is, when

$$\frac{MRS^a}{MRS^b} = \frac{dY^a/dP}{dY^b/dP} = \frac{f_p^a/f_y^a}{f_p^b/f_y^b} = \frac{f_y^b}{f_y^a},$$

where f_p^a, the first partial derivative of U^a with respect to P, is assumed equal to f_p^b, or when $MRS^a f_y^a = MRS^b f_y^b = \ldots = MRS^i f_y^i = K$ is a constant.

Then assuming that each family's marginal rate of substitution between public goods and other goods is known and that the total and marginal cost of public and specific goods is known for all relevant outputs of these goods, for a bundle of public goods to be efficiently shared by all families, it is required that

$$Y_p^i = Y_p \frac{MRS^i}{\Sigma MRS^i}$$

where Y_p is the total public good benefits (which are equal to the actual public good expenditures), and Y_p^i is the imputed

public good benfits accruing to family i. As only the ratios of MRS's matter, ΣMRS^i can be set equal to 1 so that

$$Y_p^i = Y_p MRS^i = Y_p \frac{k}{f_y^i} = Y_p \frac{1}{f_y^i} .$$

What this equation has shown is that "to each household should be imputed a function of the total value of the public good proportional to the reciprocal of its marginal utility of private good expenditures."[2]

Aaron and McGuire then specify f_y^i on the basis of disposable cash income (or the original income net of tax burdens) plus the estimated value of specific goods received, or $Y_D^k + Y_S^i = Y^i$. Then two utility functions are assumed

$$U^i = A \log Y^i + B \qquad (1)$$

$$U^i = E - \frac{C}{Y^i} \qquad (2)$$

where A, B, C, and D are arbitrary constants. Differentiating these utility functions with respect to Y^i, equations (1) and (2) become

$$dU^i/dY^i = f_y^i = A/Y^i ; \qquad (3)$$

$$dU^i/dY^i = f_y^i = C/Y^{i2} . \qquad (4)$$

If utility function (2) is used, the imputed public good benfits to family i would be

$$Y_p^i = Y_p Y^i ,$$

that is, the public good expenditures should be allocated to family i according to its proportionate share in the total money income net of tax plus the estimated value of specific good benefits. The above condition implies that the higher the income position of a family, the higher the public good benefits it will receive, other things being equal.

Aaron and McGuire believe that the marginal utility of income (for the United States) lies between -1 and -2. Shlomo Maital in a subsequent study further claimed that from at least three independent studies on the marginal utility of income there is valid reason to believe that the value of the "true" marginal utility is -1.5.[3]

So, in order to determine the net fiscal incidence in Thailand using the Aaron-McGuire-Maital (A-M-M) method, the 1969 fiscal activities based on money income distribution are selected as an example. First, the relevant tax burdens are deducted from each income class to arrive at the distribution of disposable income in the Aaron-McGuire sense. Then, the benefits of specific expenditures by income classes (rearranged from Chapter 4 by exchanging such public goods as defense, public administration, and other similar categories) are added to disposable

income to arrive at the total private good income distribution, which will be the base for public good benefit allocation.

The marginal utility of -1.5 claimed to be true by Maital for the United States is also assumed to be true for Thailand. This value is used to find the share of each income class in the total distribution of private good income, after which the total public good expenditures are allocated according to the pattern of the shares obtained. The results of this allocation and the new post-fisc income distribution using the A-M-M method are presented in Table H.1 below.

It can be seen from Table H.1 that the resulting post-fisc income distribution based on the A-M-M method has become much more unequal than the same distribution based on Assumption III in this study, which is regarded here as the most de-equalizing assumption. The lowest income class in the distribution under the A-M-M approach shares only 2.9 percent of the total money income after the effects of government fiscal activities are taken into account, whereas under Assumption III and Assumption I of this study the same income class receives 3.7 percent and 4.9 percent of the total income, respectively.

At the same time the highest income group, under the A-M-M assumption, always receives the highest income share. The Gini concentration ratios for the post-fisc income distribution are estimated at .6041, .5614, and .5289 under the A-M-M method, Assumption III, and Assumption I, respectively.

Table H.1--Comparison of the Post-Fisc Distribution of Income Based on Aaron-McGuire-Maital Method and Methods Used in This Study (Income in Millions of Baht)

Income Classes (Baht)	Disposable Income	Private Good Income	Public Good Benefits	Post-Fisc Income Distribution		Post-Fisc Income Distribution	
				A-M-M	%	Asspt. III %	Asspt. I %
Under 3,000	1,282.8	1,882.8	128.8	2,011.6	2.9	3.7	4.9
3,000- 5,999	3,997.2	4,881.2	540.3	5,421.5	7.9	8.9	9.8
6,000- 8,999	4,739.3	5,839.0	705.6	6,544.6	9.6	10.4	10.7
9,000-11,999	4,205.9	5,249.8	603.1	5,852.9	8.6	9.2	9.3
12,000-14,999	3,664.7	4,572.0	475.4	5,047.3	7.4	8.0	7.9
15,000-17,999	3,129.4	3,879.0	383.0	4,262.0	6.2	6.8	6.6
18,000 and over	25,107.5	30,779.8	8,563.5	39,343.3	57.4	52.9	50.8
All Classes	46,126.9	57,083.5	11,399.7	68,483.3	100.0	100.0	100.0
Gini Coefficient					.6041	.5614	.5289

This indicates that the A-M-M method, if used, would cause at least a 7.6 percent increase in income inequality in Thailand under the money income based in 1969 over the most de-equalizing assumption used in this study.

The use of this A-M-M method would provide an ideal case in support of the contention that the government of Thailand has effected very little change in income distribution. Indeed, instead of improving the present distribution, the public sector actually worsens it. However, the A-M-M method is not used as the main method here because it is believed to be inconsistent or incongruous with the approach adopted in this study regarding the allocation of public good benefits (which is to examine the disaggregated details of public good expenditures and then allocate the benefits to either general or specific beneficiaries according to the chosen objective or subjective criteria). Oddly enough, the present demonstration does not refute the main findings in this study; rather, it adds more weight to those findings, namely, that the Thai government is not merely indifferent to the issue of income redistribution, but is opposed to it.

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[1]Henry Aaron and Martin McGuire, "Public Goods and Income Distribution," Econometrica, 38 (November, 1920), pp. 907-20.

[2]Ibid., p. 911.

[3]Shlomo Maital, "Public Goods and Income Distribution," Econometrica, 41 (May, 1973), pp. 561-68.

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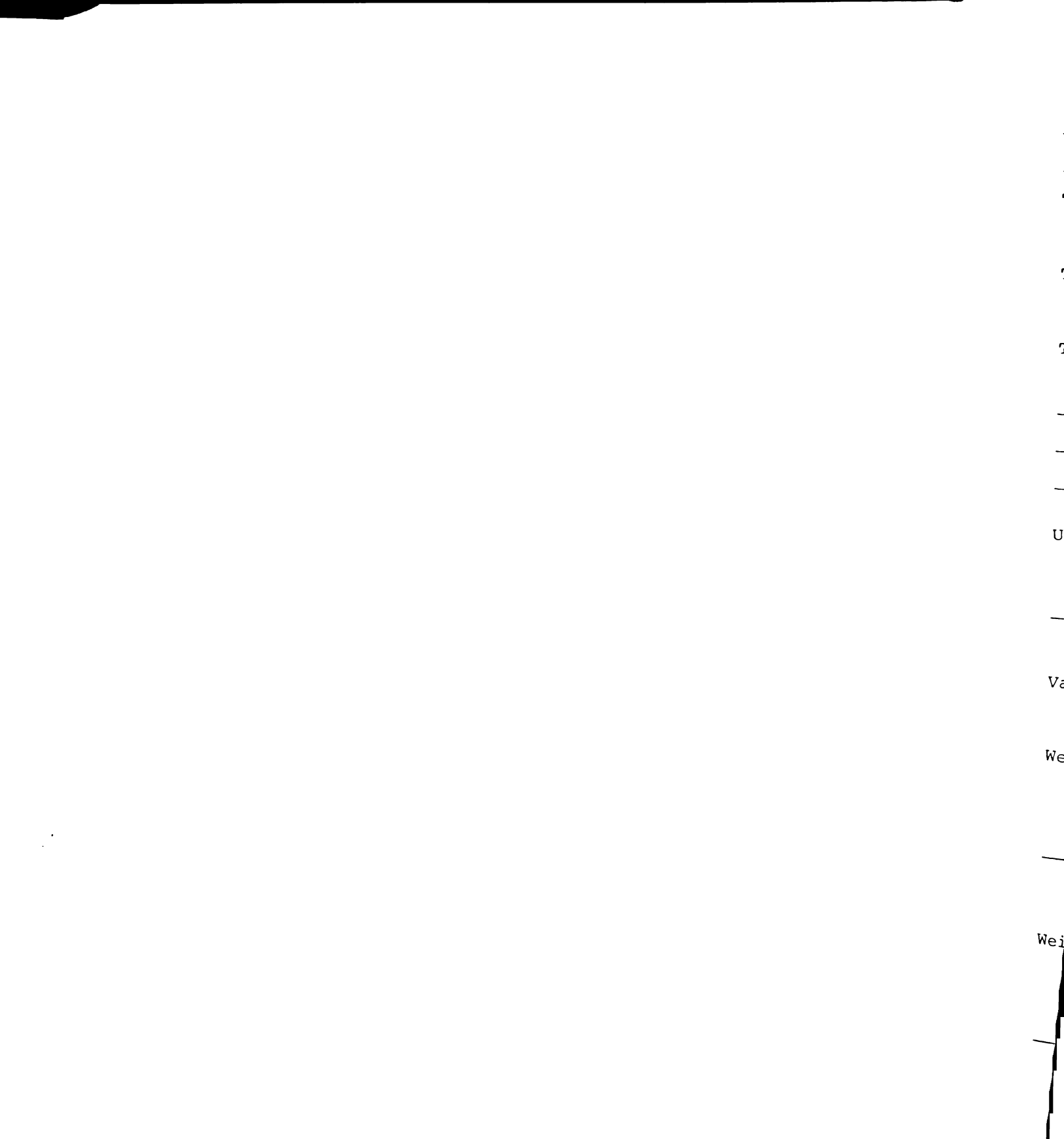

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