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THE ANALYSIS OF THAILAND GOVERNMENT EXPENDITURE: POLICY DETERMINATION

By

Songtum Pinto

A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
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ABSTRACT

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In this study, an attempt is made to understand the behaviors of the government expenditure policy focusing on its formulation and determinants. The theoretical framework is based on the welfare function as well as the incrementalist idea. From the study, it is found that: (1) In general, the models are able to explain the behavior of the government expenditure allocation reasonably well. (2) The total expenditure after interest payment, and in particular the 'incrementalist variables' have shown significant roles in determining all types of expenditure. These suggest that the total size of government expenditure in the economy and the base of previous year expenditure probably play a critical role in the expenditure allocation. In addition, the incrementalist variables have tended to influence the allocation of current expenditure (as well as other current-based expenditures) relatively stronger than capital expenditure, implying perhaps the less flexibility of the current expenditure. The influence of the incrementalist variables is the least for the government capital expenditure implying the probably most flexibility of the government capital expenditure. (3) The demographic variables are also statistically significant in determining the government expenditures. Different demographic variables, however, have different impacts on different types of expenditure. (4) The factors relating to external factors including the degree of openness and the current account are not statistically significant in impacting the government expenditure allocation. Historically, it was found that the government never borrowed abroad specifically to finance budget deficit. In addition the external borrowing under the law is limited and the government exercised a great deal of caution in using it. Compared with other countries explored in the literatures, the uses of government borrowing to reduce

private external exposure is also relatively scarce in Thailand. These factors together reduce the roles of external factor variables in explaining the budget allocation. (5) The size of the interest payment was found to have a negative relationship with the government expenditure. Here, three factors were found responsible: first the fiscal conservatism policy in the past; second the flexibility of the Thai fiscal policy; and third the elasticity of other types of expenditures with respect to interest payment.

To supplement the results from the regression analysis, a non-regression analysis has been also presented. In particular, statistical causalities were tested on the estimated equations and found that the incrementalist variables, the expenditure after interest payment as well as a number of demographic variables do have causality relationships towards government expenditures. In term of government revenue to GDP and the government expenditure to GDP, however, the relationships are two ways, implying a set of interrelationships. When the analysis was extended to investigate the impacts on economic growth and development, the findings indicate that the government expenditure policy tends to be counter-cyclical to economic growth, stimulating activities in times of economic difficulties and moderating them in the overheating periods. Finally on the institutional aspects of the government expenditure, four economic agencies combined (The Budget Bureau, MOF, BOT and, NESDB) have played a significant role in setting the scopes and checks and balances for government expenditure policy. The Budget Bureau, for example, tended to be on the higher ends of expenditure proposals while the revenue collecting agencies tended to underestimate the revenue collections. The Bank of Thailand, on the other hand, tended to prefer less government deficits. In terms of the budgeting process, the working group consisting of representatives from these agencies considered broad ranges of economic factors in the annual expenditure framework: including the level of deficit or surplus, crowding out effects in the money market, and debt sustainability.

From the present study, three policy suggestions may be drawn: 1) Increase the flexibility in the current expenditures and reduce the role of the incrementalist variables by introducing the performance based budgeting rather than 'incremental' allocation as in the current system 2) Specify a framework for the global and medium term budget and increase the roles of the NESDB in monitoring the annual budget against the benchmarks set out in the National Economic and Social Development Plan, and 4) Avoid becoming overly concerned with public debt sustainability issue.

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Any deficiencies are my sole responsibilities.

Songtum Pinto

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CHAPTER 1

INTRODUCTION

1.1 Significance of the Problem

Public policy is often defined as whatever the government chose to do or not to do to fulfill the government functions (Dye, 1978:1). To implement a policy the government uses various types of policy instruments including: laws and regulations such as enacting the environmental laws to protect the environment; tax structure as in the case of taxing at progressive rate to redistribute income more equitably; the budgetary process to promote desirable activities and outcomes.

Among these instruments, the government expenditure policy is very critical because it mirrors the amount of resources ear-marked by the government for specific purposes. It therefore plays a significant role in setting the directions of policies by the government. For instance, an uneven income distribution, backward agricultural sector, or the social unrest can all be addressed directly and immediately by government expenditures allocation. The intricacies of these problems, however, are well-known. For example, an allocation of expenditure to education and health may also lessen the future social problems at the same time. The impacts of expenditure policy are therefore pervasive to most sectors. It is important to understand this budget allocation process and behaviors—in particular how the government expenditure policy is formulated, and what factors are taken into considerations.

So far, the literature in this area has been relatively scarce. Moreover, most of the previous studies employed cross country analysis, while specific country time series analysis have been performed in only a few researches particular in developed countries such as the United States and the United Kingdom. This is mainly due to:

First, a time series analysis of a specific country requires a long range of data, which is scare among developing countries where a comprehensive database is yet in to be developed. As a result, a research of this kind could only be performed in

countries with good data compilation such as the United Kingdom and the United States.

Second, a country specific analysis requires the researchers to have a good background information either on the budgetary system, politics. economics and societies in the country under study. This leaves a comparative advantage in the hands of native researchers.

Finally, the implications drawn from this kind of study is not international generalization, as the cross-country analysis. As a result, researchers from international organizations tended to find the international comparison and cross-country analysis more attractive.

However, in the case of Thailand, it is crucial that we explore this background more thoroughly. While the results cannot be generalized, an improved understanding may help policy makers to identify strength and weaknesses as well as to redesign parts of the process to enhance efficiency for the benefits of the public at large.

An improved understanding may also contribute to enhancement of precision in their predictive capabilities, which, in turn, should help to improve public resource management efficiency in both short and long terms.

1.2 Research Questions

This thesis is an explanatory research. aimed to explain the behavior, pattern. and development as well as the determinants of government expenditure in Thailand. In this analysis. the government expenditure is analyzed both in terms of level and its allocation, rendering the government expenditure the dependent variable. To explain this government expenditure policy. a number of independent variables are used– social. economic. demographic. political. technology. and other policy variables. which are hypothesized and tested for their statistical significance the determinants of the government expenditure.

Chronologically. this research attempts to relate the intertemporal government expenditure to the historical events of the period. For this purpose. empirical analyses are used to explain the evolution of the government expenditure in Thailand. To

define the perimeter and depth of these analyses, the present study will focus particularly on the following research questions.

1. What is the pattern of government expenditure how it has evolved in relation to the historical events of the period did and how its allocation changed over time?

2. What factors determined the government expenditure and its allocation, and did the socio-economic and demographic factors play a critical role in explaining it?

1.3 Objectives

The prime objective of this thesis is to improve an understanding of the behavior of the government expenditure particularly its key determinants and their interactions, including:

1. To investigate the historical developmer.. of the government expenditure policy, and identify economic variables critical to this policy such as the national income.

2. To investigate and identify key determinants of government expenditure level.

3. To analyze the allocation of government expenditure among various activities.

1.4 Scope of the Study

The subject – matter of public finance that is normally terms fiscal policy includes: i) government expenditure on provision of goods and services ii) government revenue iii) government borrowing and the national debt. In this study, the analyses will be focused only on government expenditure. While government expenditure in a broader sense includes both central government and local government, in this study only the central government expenditure will be employed due to four reasons:

1. The local government expenditure is relatively small, accounting for only nine percent of central government expenditure.

2. As parts of the local government expenditure is subsidized by the central government, an inclusion of the local expenditure in the analysis may lead to a problem of double counting.

3. By its nature of operations, the local government in Thailand is highly dependent (an thus lacks the degree of autonomy to be analyzed) on the central government, unlike the more decentralized and more developed countries such as the U.S.

4. By law, the local government cannot run a fiscal deficit, restricting its expenditure policy even further. The only one variable that can affect its expenditure setting is capability to raise revenue.

1.5 Limitations of the Study

1. The period of analysis utilized in this study is limited to 1960 and in some cases only 1970 particularly for the data classified according to the GFS (Government Finance Statistics) basis. The completeness as well as the confidence of the results of a time series analysis critically depends on the length of the data period. While the general degrees of freedom are judged to be adequate, a more comprehensive set of data would strengthen the results further.

2. The period of the study ended only in the year 2000. The analysis therefore have been less representative of the period of the crisis beginning in 1997. The estimated relationships between the government expenditure and the explanatory variables have therefore been based mostly on the observations in the past. Whether the current crisis has significantly changed the past behavior should be an issue for further researchers when an adequate period of observation becomes available in the future. For the present study, it probably suffices to say that during the period of 1960-2000 the country and thus fiscal policy has experienced at least two crises. The government's behaviors under crises have therefore been partly captured in this study; although the current

crisis has arguably some impacts on the fiscal adjustments that may be different from the past crises.

3. As mentioned in the scope of the study, this study has been limited to only the central government due to the rather confined roles of the local government in the past. The current implementation of the Decentralization Law, which enables the local government to expand and become more independent, should eventually lead to significantly different fiscal adjustments as well as the budgetary process of the central government. This issue is not investigated in this study. Similarly, this study does not cover the behavior of the state enterprises expenditure determination again due to data limitation. The result in this study should therefore be interpreted and applied strictly to the case of central government.

1.6 Benefits of the Study

The results from this study should be beneficial to both academia and policy makers in the following ways.

1. The finding that the government expenditure policy can be endogenously explained by a set of the independent variables should stimulate discussions and open up areas of further academic researches on policy analyses. Given the traditional treatment of government expenditure in economics as ex ante or exogenous, the results found in this study should at least motivate them to pay more attention to the plausibility of such an assumption.

2. The study results should increase an understanding of the policy analysts on the behavior of the government expenditure in Thailand. This will help policy makers to develop deeper analyses that will enhance efficiency in the fiscal policy implementation as well as evaluate its consequences.

3. A deeper understanding of the government expenditure behavior as well as its development will help the authorities (including public agencies) to make better contributions to the policy formulation process with hopefully more desirable outcomes.

1.7 Types of Data and the Unit of Analysis

Time series regressive analysis will be employed, based on secondary data. The unit of analysis is the government as a whole.

1.8 Organization of the Study

Following this chapter, a review of literature covering all relevant studies and their theoretical frameworks will be presented in chapter 2. The strength and weakness of each framework combined then form a basis for the studies in subsequent chapters.

In the third chapter, the methodology of the present study is described laying out a blue print on how the study will be conducted in order to achieve its objectives. Specifically, this includes a framework of the study, the theoretical aspects, as well as the empirical propositions on which empirical tests will be performed based on actual data.

The fourth chapter is the empirical analyses of the proposed models, as well as the interpretation of the tested results. The relevant qualitative evidences will also be presented in this chapter to supplement the results from the estimated equations. The reasons behind these results as well as the discussions of the historical events relevant to the tested result would be thoroughly examined in this chapter.

Bearing in mind the limitation as well as the inflexibility of some of the results from the regression analyses, further investigations are made in chapter 5 on the impacts of other factors to elaborate on the regression results of the previous chapter. This chapter will be divided into 4 sub sections. In the first sub section, causality relationships on the estimated equations are statistically investigated. This is aimed to consolidate the results found in the previous chapter. In the second sub section, a causality test is performed to see whether government revenue causes government

expenditure or vice versa. In the third sub section, an investigation is made of the impacts of the economic growth and development on the government expenditure policy. In this subsection, the data as far back as 1960 will be presented and analyzed to identify relationships between economic growth as well as its patterns during the various periods and the determination of the government expenditure. In the last but not least important sub section, the institutional aspects of the government expenditure policy determination will be discussed. The actual annual budgetary process as well as the influence of the relevant government agencies in determining the government expenditure will be analyzed and investigated. In short the analysis in this chapter should explore the qualitative aspects not yet touched up on by the quantitative analysis and modeling in the previous chapter.

This last chapter closes with conclusions and the policy suggestions based on what have been found in the study. With the limitations of study in mind, some suggestions and issues for further studies are suggested.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Literature Review

In the literature, there are only a few studies with clear theoretical frameworks for analyzing specifically the determinants, pattern and behavior of government expenditure and its allocation among economic activities. This is because traditionally the research economists tended to assume that the government expenditure is exogenously determined and left outside the sphere of interrelationships with other economic variables. Consequently they tended to concentrate on how the government expenditure affects other economic variables such as economic growth, inflation, external balances, rather than focusing on the determinants of government expenditure policy. Domar, the distinguished economist, accepted that government spending is the most troublesome form of the three expenditures (private consumption expenditure, private investment expenditure and the government expenditure) because there was no theory of government expenditure. In its absence, government was usually imposed on top of the other two as an exogenous factor. The aggregate government expenditure was thus more often than not left outside the system of mutual determination of economic model (Domar, 1957:16-34).

This treatment is particularly not satisfactory for policy analysis field of study. Given the apparent existence of government expenditure, it is implausible to argue that it neither influences economic growth nor other economic and social variables, nor is itself influenced by economic growth or other economic and social variables (Peacock and Wiseman, 1967: 21-31). An example of this realization of the importance of the social economic variables on policy determination is the study by a policy analyst named Dye. He explicitly laid out the mainstream of idea that a policy can not be in vacuum but must be interrelated to processes among policies themselves and

the environment (Dye, 1978:1). Along a similar line, Mosley (Mosley, 1984) tried to explain the making of macro-economic policy in Britain since the war. Here, an unconventional belief is tested that government economic policy and actions are not implemented in a random and unpredictable manner but are instead logically enough, guided by their self-interest and by their perception of the economic situation at the time. Subsequently, economists as well as policy analysts at the policy- practice organizations such as the World Bank and the International Monetary Fund also turned to pay more attention to policy determination researches, although they were not explicitly named as policy researches. These researches will be reviewed below. It should be noted, however, that the early stages researches on the government expenditure are likely to study both the overall pattern of expenditure as well as the pattern of specific purpose of expenditure such as the expenditure for defense, wage and salary. Some researchers among these authors are Wagner, Peacock and Wiseman. The later stages of these researches turned to focus more on specific purpose expenditure, except for Mosley, who still paid attention to both overall and specific expenditure. Among them are, for example, the study on the determinants of public education expenditure in the U.S. during 1950-1990 by Fernandez and Rogenson (Fernandez, et al., 1997); the study on determinants of education policy by using the government expenditure policy as proxy, done by Sombat Thamrongtanyawong (Sombat Thamrongtanyawong, 1994); the study on determinants of public expenditure on infrastructure as performed by economists at the World Bank (Randolph, et al., 1996); the study of wage expenditure of central governments by Hewitt and Rijckghem 1995; the economic determinants of government subsidies by Clement, et al. 1998; the international comparisons of government expenditure as performed by Tait and Heller 1982 and later by Tinnakorn and Sussankarn 1996.

Most of these studies as well as relevant theoretical backgrounds are reviewed below. From this review, a theoretical framework will be proposed in the next chapter followed by the empirical results presented the context of these background, empirical findings and theoretical aspects outlined in this chapter.

2.1.1 Wagner's law

Wagner (Wagner, 1958: 1-16) is one of the schools of thought of public expenditures. Its aim is to establish generalizations about government expenditures, not from postulates about the logic of choice, but rather by direct inference from historical evidence. The approach is perhaps encouraged by a growing awareness towards the correlative growth of community output and public expenditure that was observed in a number of countries (e.g., Prussia, Bavaria, Britain, North America, Switzerland). These countries had in common a rising trend of output per head, but differed markedly in other important respects. Attempts were made to explain the phenomenon by growing military and national debt commitments, but the increases in expenditure affected too many other services, and the military and debt commitments also varied a great deal from one country to another. Consequently it came to be argued that the data supported the existence of some kind of general law ("law relating the growth of output per head and the growth of government spending"). Clearly, the existence of any law of this kind, if it can be established, should be a matter of importance. In general, economists writing at the turn of the century inferred no more than that the available statistics suggested that government expenditure must grow in proportion to a community's output per head. This was the view of H. C. Adams (Musgrave and Musgrave, 1989). Wagner went beyond this, however, arguing that government expenditure must increase at an even faster rate than output. The core of his argument is that the law [of increasing state activity] is the result of empirical observation in progressive countries, at least in Western European civilization; its explanation, justification and cause is the pressure of social progress and the resulting changes in the relative spheres of private and public economy, especially compulsory public economy (Peacock and Wiseman, 1967: 21-31). Yet, financial stringency may hamper the expansion of state activities, causing their extent to be conditioned by revenue affordability. In the long run, nevertheless, the desire for development of a progressive people will always overcome these financial difficulties (Wagner, 1958: 1-16).

The first point of importance about this argument is its implication that the growth in expenditure derives from the growth in state activity, which is in itself the

consequence of social progress. In other words, Wagner's law is really and shortly a law of increasing state activity: to the extent that such increased activity is the inevitable accompaniment of social progress.

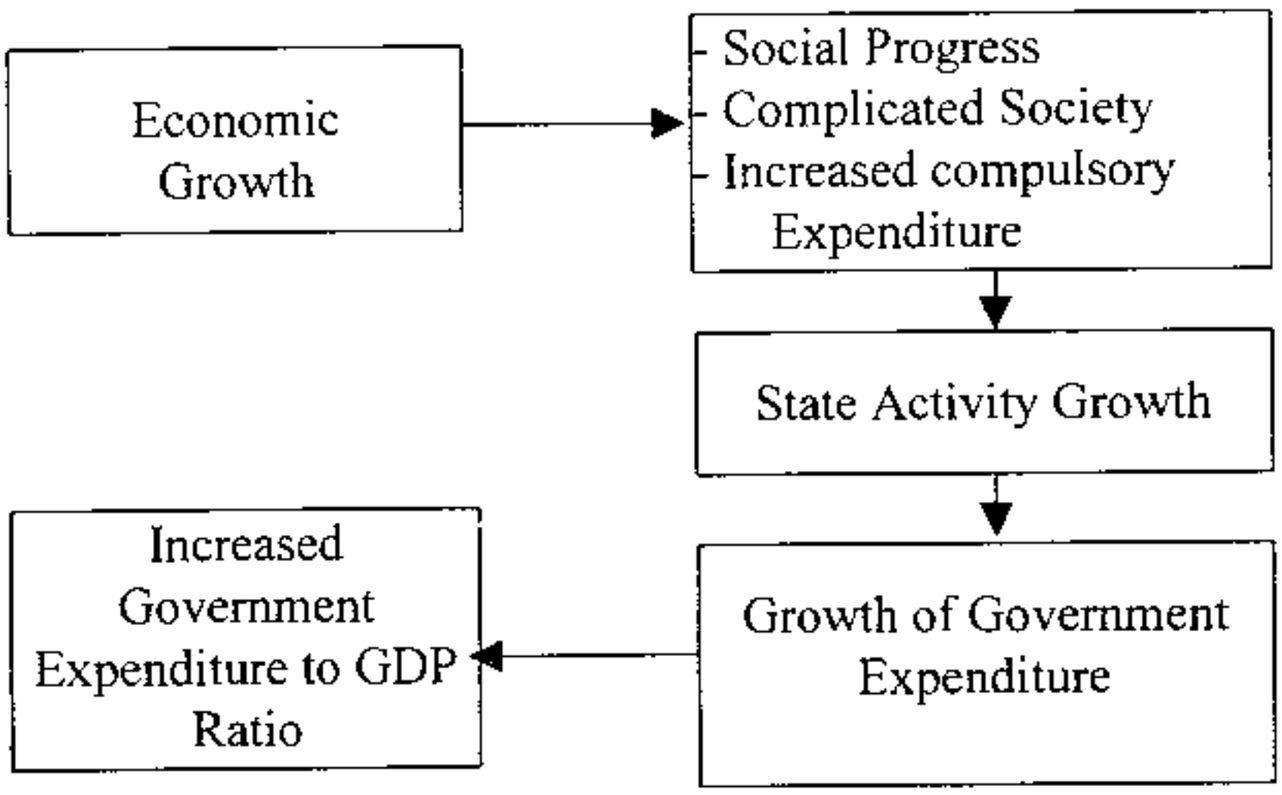


Diagram 2.1 Framework of Wagner's Analysis

The law is concerned with the secular behavior of expenditure rather than with short-run change or the actual process of change. Further, Wagner does not suggest that actual extent of state activity can be fixed a priori. His concern is with the rate of growth of expenditure; he cites as proof of his law the fact that for a number of countries it was empirically verifiable that as output per head increased in the past, state activity and expenditure grew more than proportionately.

To explain the existence of the law, Wagner distinguished between three types of state activity:

1. maintenance and enforcement of law and order internally and externally

2. the provision of the necessary social preconditions for markets to function and participation in material production

3. provision of such economic or social services as postal, education and banking services.

Separated reasoning is made for separated activities. The first group of activities can be explained by the need for increased participation by the state originating in the "inevitable" centralization of administration and in the "atomization" of social and economic life that result from economic development. At

the same time the state has to increase its activities in order to ensure the maintenance and improvement of the quality of the services it provides. In addition increasing division of labor multiplies the complexities of economic life and hence the possible causes of friction. Thus if the economy is to function efficiently, state activities of both a preventive and a repressive character have to increase.

Growing state participation in material production (the second type of state activity) develops because new technical processes make the public corporation the only alternative to the joint stock company. It is a necessary and a preferable alternative, because the joint stock companies might not be able to handle large amounts of capital as effectively as a public corporation, because private enterprises mismanage and waste capital during business cycles and enhance such cycles by causing speculative disturbances. The view of Wagner in this activity is in line with the concept of natural monopoly where in some industries they need huge amount of initial, fix investment so that the private alone can not afford this fund. Or even in the case that private can provide this big amount of fund, the will be only one or few producers in the economy which lead to the monopoly climate.

Finally, increased activity of the third type must arise where technical developments produce favorable conditions for monopolies, where the social benefits of the service are not susceptible to economic evaluation (e.g., education), and, once again, where the state could become a source of stability by taking over large enterprises whose dominating influence encourages instability.

It should be noted that Wagner himself did not put forward his law as perpetual but he expected the law to hold at least for the near future. Also it is still subject to some criticism. First, it is based upon historical evidence; its acceptance as anything more than a statistical observation requires acceptance also of Wagner's own very special view of the nature of the state as a political entity. Second, careful examination suggests that what appear to be simply technical reasons for expenditure growths in Wagner's exposition are often not independent of his views about the state.

Implication of the Wagner's is that the government expenditure will increase overtime in line with the increasing society complication. Wagner not only propose

he also observe his proposition in the real world what he found can be concluded as follows:

1. The function of the state is continually extended and led to an increase in public expenditure on administration and regulation.

2. The national income is the catalyst to the increased government expenditure through the expenditure programs contingent with the economic growth. These expenditures include education, health, and welfare.

3. The government expenditure tends to grow proportionately more than the national income growth, following the complication of the society both in term of social and business relation. The modernization to the industrial society would also lead to increased political pressure for social progress and calling for increased social allowance. This together give rise to increased government expenditure and finally the increased ratio of government expenditure to national income (Musgrave and Musgrave, 1989: 113-129).

The implication of the Wagner's is that given the modernization trend of any country in general the government expenditure will increase overtime. More specifically we also can draw from this proposition that any variables representing the degree of modernization, country development, and social complication should also affect the government expenditure policy. Although the application of Wagner law is questionable for today scholars, its usefulness has been prevailed in activating academic to beware and think about the long lasting increase of the public expenditure. The succeeding scholars as ignited by Wagner have observed actual public expenditure phenomena and try to find factors explaining such pattern. Peacock and Wiseman (Peacock and Wiseman, 1967: 21-31) try to relate the explosion of public expenditure with the period of war. They propose that growth of public expenditure during a war is evitable and called this relation the Displacement Effect. They found that expenditure increases in the period of war and social crisis. Public expenditure will fall once the war and crisis is resolved but not to the original level at the start of emergency as a result growth in public expenditure occurs in stages (Dickenson, 1996: 71-90).

The study by the OECD has found that the growth of public expenditure observed by the Wagner in the nineteenth century has continued in the twentieth century. Over a period of 20 years public expenditure in all the major countries increased at faster rate than the national income, implying the growing public expenditure to GNP ratio or the expansion of public sector. In the mid-1950s, public expenditure was on average less than 30 percent of the country GNP, by the mid - 1970s it was over 40 percent for many countries and in some country around 50 percent.

OECD study has reached three conclusions:

1. From the international comparison, no typical pattern of growth in public expenditure emerges. In some countries that had a particularly sharp increase this was simply the result of above average expenditure on welfare—in others, the impetus came from education.

2. There did not appear to be a tendency for countries with low expenditure on some of the social welfare programs and for country with high expenditure to converge to a common norm. But the dispersion continues and also increases.

3. In Europe after facing with the rising of public expenditure they have implemented a number of retrenchment program to reduce public size. In some countries in 1980s succeeded in achieving this objective, but in 1990s the upward trend has resumed (OECD, 1978: 1-20).

In short the study by OECD conclude that it is difficult to find specific trend and pattern of pubic expenditure growth.

2.1.2 Displacement effect hypothesis or threshold hypothesis

Many scholars commented that both the secular character and the historical inevitability of Wagner's make difficulties for the development of ideas about government expenditure that will be useful in considering shorter-term questions. Therefore, Peacock and Wiseman (1967), have investigated facts about the expenditures of Western governments during the nineteenth century. They found that while government expenditure has clearly grown (at least in money terms) over the period as a whole for all countries for which adequate statistics are available, the time pattern of growth is less regular than, and quite different from, the corresponding

pattern of growth in the size of community output. Previous quotation from Wagner indicates that he was aware of at least one possible reason for these divergent time patterns the dependence of governments upon revenues raised by taxation. But he was interested in pursuing with the secular trend of expenditures and he did not believe these to be affected by the short-run problems of raising revenue. Peacock and Wiseman, however, concern with short-run phenomena, particularly the reasons for the time pattern of expenditure growth. Typically, the time chart of government money expenditures in many countries they investigates shows a series of mountain ranges, with peaks of increasing height separated by plateaus. In the British case, the major peaks occur in the periods covered by the two world wars. There is, of course, obvious reason to expect the share of community output taken by the government to rise in wartime; the divergence in the time patterns of the two series under discussion would be of little interest if it could be attributed simply to the war effect. In fact, although British government expenditure declines after the wars, it does not return to the prewar level, and a similar pattern is to be observed in other countries similarly affected.

To provide a satisfactory explanation of this time pattern of government nature and behavior of governments. They start from the important observation to which Wagner himself has directed attention: that government expenditure depends broadly on revenues raised by taxation. That is, decisions about such expenditure are influenced or controlled through the ballot box to which the citizens can bring pressure to their government. Thus the divergence of the revenue expenditure ideas of citizens is of potential relevance as a means of explaining the time pattern of government expenditure growth in a large number of societies.

When societies are not being subjected to unusually violent pressures or disturbances, such as war, people's ideas about the "tolerable" burden of government taxation tend to be fairly stable. Governments may of course have plans that would increase their expenditures, and the plans may be thought desirable by many of the citizens. Nevertheless, their implementation, and thus the rate of growth of government expenditure, will depend upon the view taken by the government as to the revenues that it is (politically) able to raise as well as upon its own views as to the

desirability increasing government expenditures. Consequently government expenditure may rise in such periods, but if so it will do so at a steady and relatively unspectacular rate, curbed by such economic factors as the disincentive effects of high marginal rates of tax and also by popular notions of tolerable tax burdens and by the degree of political control exercised by the citizens over their government through ballot box., but encouraged by a rising output per head. This divergence can be adjusted by social disturbances that destroy established conceptions and produce a displacement effect. People will accept, in a period of crisis, tax levels and methods of raising revenue that in peace times they would have thought intolerable, and this acceptance remains when the disturbance itself has disappeared. As a result, the revenue and expenditure statistics of the government show a displacement after periods of social disturbance. Expenditures may fall when the disturbance is over, but they are less likely to return to the old level. Possibly after that time states may want to do things it might formerly did, but politically unable to raise the necessary revenues to finance such expenditure. The same time, as the result of the government being obliged by disturbance to assume functions that it cannot easily return to others and as a consequence of changed ideas induced or encouraged by the disturbance itself, social disturbances may also impose new and continuing obligations upon a government, as aftermath of the disturbance (for example, the provision by a government of war pensions) (Peacock and Wiseman, 1967).

The ideas of Peacock and Wiseman is pretty clear that when societies are not being subjected to unusual pressures, people's ideas about tolerable burdens of taxation, translated into ideas of reasonable tax, tend also to be fairly stable. Much more rapid rates of expenditure growth are unlikely; in settled times, notions about taxation are likely to be more influential than ideas about desirable increases in expenditure in deciding the size and rate of growth of the public sector. There might be a persistent divergence between ideas about desirable public spending and ideas about the limits of taxation. This divergence may be narrowed by large-scale social disturbances such as major wars. Such disturbances may create a displacement effect, shifting public revenues and expenditures to new levels. After the disturbance is over new ideas of tolerable tax levels emerge, and a new plateau of expenditure may be

reached, with public expenditures again taking a broadly constant share of gross national product, though a different share from the former one. People will accept. In times of crisis, methods of raising revenue formerly thought intolerable, and acceptance of new tax levels remains when the disturbance has disappeared. Expenditures, which the government may have thought desirable, before facing disturbance, but which it did not then dare to implement, consequently become possible. At the same time, social upheavals impose new and continuing obligations on governments both as the aftermath of functions assured in wartime (e.g., payments of war pensions, debt interest,) and as the result of changes in social ideas. Wars often force the attention of governments and peoples to problems of which they mere formerly less conscious-there is what Peacock and Wiseman called inspection affect which should not be underestimated.

Basing on the ideas offered by Peacock and Wiseman, Musgrave (Musgrave and Musgrave, 1989: 114-116) have tested this hypothesis to the case of U.S.A. They found that overall expenditure ratio rose sharply during both world Wars' and fell off sharply thereafter. It is also noted that the ratio for defense-related expenditures remains above prewar levels. All these facts are in line with the hypothesis. However, the pattern of civilian expenditures may also be taken to reflect the nominal rise of the expenditure ratio—as shown in table 2.1. It should be concluded that the hypothesis, while interesting, can not be taken to give a conclusive explanation of the growth of the public expenditure ratio, at least in the case of civil expenditure in the United States. The table also shows that the Vietnam war did not result in a sharp increase in the expenditure ratio comparable to that of previous wars, the ratio of defense expenditures to GNP in general declining over the decade of the 1960s (Musgrave and Musgrave, 1989: 127-128)

Table 2.1 The United State Public Expenditures in War Years
(As Percentage of GNP; All Levels of Government)

	Fiscal Year	Total	Defense-Related	Civilian
World War I	1913	8	1.1	6.9
	1919	29.4	17.7	11.7
	1922	12.1	1.9	10.2
	1938	19.1	1.8	17.3
World War II	1945	46.1	39.2	6.9
	1948	22.3	7.4	14.9
Korean War	1953	30.9	15.4	15.5
	1955	29.1	11.9	17.2
	1965	27.6	8.5	19.1
Vietnam War	1969	34.3	9.9	24.4
	1971	33.1	8.1	25
	1987	34.4	6.7	27.7

Sources: Burkhend, Jesse. 1956. Government Budgeting. New York: John Wiley and Sons.

2.1.3 The welfare theory

Many economists have approached the study of public expenditures from a prescriptive point of view. Such studies attempt to set up criteria for the size and nature of government expenditures and income by utilizing techniques usual in the study of market economics. Starting from some concept of economic welfare, defined in terms of individual choice, they attempt to specify the taxing and spending activities of government that would conduce to the ideal conditions of such welfare. As for the extreme case this leads to proposals for systems of public finance in which the government provides only the services that individuals would pay for directly, if that were feasible, and levies only such taxes, as individuals would voluntarily pay in return. Alternatively, such writers may regard the government as a unitary being, with tastes and preferences like other beings. Its income and expenditure can then be

examined as those of an individual, and the size and character of the public sector as well as the government expenditure determination prescribed by the application of marginal criteria similar to those generally employed for instance, in the study of individual consumers, which is normally known as the utilitarian approach to economic welfare (Dickenson, 1996: 71-89). The theory of marginal utility seeks to provide a basis for the measurement of satisfaction (utility) derived from consumption of one additional (marginal) unit of a good or service. According to the theory, a person will maximize their satisfaction by acquiring goods or services up to the point where the ratio of price to the utility of the additional unit will be the same. The application of this equi-marginal utility principle will result in the optimum allocation of a person's resources. The principle can also be applied to a society – in that case requiring the aggregation of satisfaction of all its members. In practice neither an individual's nor a society's satisfaction can be precisely or objectively measured and consumers of public goods and services may not have to pay a price directly. The principle of maximizing utility has, however, found expression in cost-benefit analysis, which attempts to put monetary value on tangible and intangible benefits and costs resulting from the use of resources. Further sophistication can be introduced by recognizing that people can choose to use the political process rather than the market to make decisions about the utilization of economic resources. The political voting system is in this context is an alternative of the market voting system. This approach leads to consideration of alternative political voting systems, but with a view primarily to the discovery of what kind of system will best achieve the postulated objective: attainment of the ideal conditions of individual choice. The ideal political system is thus regarded as one that best promotes economic liberalism, and the ideal volume and type of government expenditure is that which such a system would generate. These theories all derive from the system of market analysis that is commonly known as welfare economics. There consideration lead to doubts among economists as to the value of welfare economics as a basis for economic policy and as a starting point for the study of actual economies. To the extent that such skepticism is well founded, the associated theories of public expenditure must become more dubious. What is more destructive, from our point of view, is the fact that although these theories of

government income and expenditure purport to be prescriptive in nature, even the most sophisticated of them (which do at least admit consideration of voting systems) treat the problems of government and political behavior in a fashion that any political scientist must consider unrealistic.

Although subject to much criticism on their applicability to the real world, this theory has been advanced continually by many economists such as Karl Menger, Leon Walras, and Herman Gossen, including the very recent studies as Hewitt and Rijckghem 1995. In short we can say that this theory is economic-based postulating that as person consumption increases, each additional (marginal) unit of goods consumed give lower satisfaction (utility) than the one before. Thus the consumer experiences diminishing marginal utility. If this theory is apply to money we can conclude that the more money the person has, the less important he or she will attach to each additional unit of money. Based on this idea we can derive the relationship between the satisfaction derive from the consumption of goods and services provided by the government, and the sacrifice the people involve in paying tax to finance government expenditure (Dickinson, 1996: 71-89). There is a point which the burden of taxation appears greater than the benefit from consuming the goods and services provided by the government, consequently the people will not prefer to pay more tax, restraining the increase of government expenditure.

2.1.4 The theory of public choice

To examine the cause of government expenditure policy or budget determination it should be noted that it involve a political process as equally as an economic or market process. These two disciplines must be draw on in dealing with budget determination decision making. The theory of public choice takes into account these two disciplines; it transgresses the traditional bound of economics and invests in adjacent of political theory.

Public Choice, which is in essence, is the uses of economic tools to deal- with the traditional problems of political science. Historically, economics (political economy) deals largely with the choice of government policies with respect to economic matters. In examining answer to such question the economics was and is

assumed that the government was attempting essentially to maximize some kind of welfare function for society as a whole as discussed in the previous section.

Businessmen can not in either way be assumed to devote a great deal of time and attention to maximizing the public interest. Although they will in general cases make some donation to help the poor, basically they are concerned and have the final goal to benefit themselves. In the theory of public choice, the voters assume to be as a customer and the politician as a businessman or entrepreneur. We also assume that the government bureaucracy will attempt to produce policies, which in the view of their superior are good, because that is how their promotions and remuneration rise and secure. Individual probably has at least some willingness to sacrifices for the public goods. Business men contribute both time and money to worthy causes and politician on occasion vote for thing that they think are right later than thing which will help them get re-elected. In both cases however this is relatively minor activity compare to maximizing one's own well- being.

Public choice assume specifically that voters politician and bureaucrats are assumed to be mainly self-interested then it becomes possible to employ tool of analysis to that which are derived from economic methodology, as a result. Fairly rigorous models have been developed which can be tested with the same kind of statistical procedures that are use in economics. Although their data are drawn from the political field. The result is the new theory of political which is more rigorous, more realistic, and better empirically tested than the traditional theory. The two theories have been developed based on the ideas of the public choice sphere. These are The Ballot box theory, and the positive theory of government expenditure.

2.1.5 The Ballot box theory

In this theory people preference will be revealed by electoral vote. In a democratic country people have the opportunity to choice how much they want the government to provide for them. Their personal preferences can be revealed by putting a vote for a political parties whose policies most closely reflects their preferences. It is the majority vote, an aggregated individual preference, which mandate the government to carry out the policy (Dickinson, 1996: 77). The implication of this theory is that the level of government expenditure as well as its

allocation is determined by the people preferences. This theory however has some limitations. First it can not be applied to non-democratic society. Second at any general election, people vote on a number of issues and policy packages; consequently the electors have no chance to express their view on a particular issue or policy. Lastly the way that elected political parties interpret people mandate to concrete policy measure is in practice difficult and less precise. As a result the government expenditure policy set up by the elected
political party may not reflect people preferences.

2.1.6 The positive theory of government expenditure

Current economists such as A. Downs, J.M. Buchman and G. Tullock have advanced this idea. The main assumption of this theory is that in a democratic society government seeks to be in the position as long as possible while voters or people seek to maximize the benefits they receive from the government. As a result the increase in government expenditure is preferable for people as long as they have not to pay tax to finance it (Dickinson, 1996: 77-78). The idea of this theory is popular in the real world where we can observe that in a democratic country, the government tends to run a deficit in order to satisfy voter needs. Finally the government debt is accumulated. The explanation power of this theory is acceptable because it can be observed that in many democratic countries both developed and developing countries around the world accumulate a huge debt. In line with this theory there is a tendency for democratic government to increase expenditure and increase government deficit (Rangsan Thanapornpan, 1998: 12-18).

The theory of social, or public, goods provides a rationale for the allocation function of budget policy. Although difficult to resolve, it is of central important to the economics of the public sector, just as the theories of the consumer household and of the firm as at the core of private sector economics.

2.1.7 The incrementalist model

The model views public policy as a continuation of past government activities with only incremental modifications. The existing policies are considered as a base and attentions are made on the new programs and modification of current program.

Because a public policy maker is perceived as a person who does not have adequate time, brain and resources to formulate all the various policies, the policy makers tend to accept the policies of the past as satisfactory and legitimate due to: first, the existing policy still have sunk costs that possibly would be impossible to retrieve if new radical course of policy were to be taken,--the heavy investments of existing programs precluding any radical change; second the uncertainty or risks inherent in contingent to the introduction of new policy; finally the politically expedience.

2.1.8 The rationalist model

Rationalism attempts to achieve the opposite to incrementalism. A rational policy is presumably one that achieves maximum social gains. A rational government should therefore choose the policy resulting in gains exceeding costs at the greatest amount. This requires the policy makers to: 1) know all the society's values or preferences and their relative weights, 2) know all the policy options available, 3) know all impacts of each policy option, 4) calculate the ratio of benefit and cost of each policy, 5) select the most efficient policy alternative. This theory, however, has a number of limitations in practice as:-

1. There are no unanimously social benefits (or unique social welfare function)

2. Often benefits and costs can not be compared or weighed directly

3. Policy makers may choose to maximize profits rather than achieve rational societal goals

4. Policy makers tended to be satisfied with some progresses rather than, the most optional alternatives.

2.1.9 Recent empirical studies on the expenditure policy determination

among the prominent empirical studies in the literature, Tait and Heller (Tait and Heller, 1982: 1-27) have studied the government expenditure allocation in a number of developed and developing countries in 1977 by regressing the government expenditure on various economic and demographic variables. From this study, six groups of factors can be identified: 1) demographic influences, 2) sociological concerns, 3) the structure of the economy, 4) the level of economic development, 5) technological factors and 6) environmental factors.

Demographic influences, in particular, were found to be principal underlying determinants of the demand for services. The larger is the share of school-age groups in the population, for example, the greater will be the likely demand for education; the higher the percentage of elderly people in the population the greater the demand for medical care and perhaps more elaborate public mechanisms for old-age support. Other demographic variables, such as life expectancy, population growth, share of population in urban areas, and infant or child mortality rate may imply the existence of a core underlying demand for certain types of services.

Sociological concerns may explain whether there is a demand for the public sector to also provide certain services; for example the need for a social security mechanism is greater where extended family arrangements have broken down.

The sectoral structure of an economy may play a key role in shaping priorities for public expenditure. A dominant agricultural sector may require certain forms of public expenditure on agriculture to complement or service private sector activities.

The level of economic development might also be critical in the sense that at low levels of development, the desire to change the structure of the economy may stimulate public expenditure in sectors that are not currently dominant in total outputs.

Technological factors influence the cost of realizing expenditure objectives. For example, the lower is the desired pupil-to-teacher ratio, the higher will be the cost of realizing a given percentage of enrollment for the population.

Environmental factors may influence both the cost of providing services and the likely magnitude of the underlying demand; for example, poor access to clean water may imply a significant demand for investment to provide drinking water as well as the likely need for medical services because of the effects of contaminated water supplies. These variables all focus on the major factors underlying the demand for public services.

Yet, clearly, the level of real per capita income is the ultimate constraint on how much, in total, of that demand can be satisfied. In a typical low-income country, the high population growth rates have tended to produce a population structure with a relatively high percentage in the school-age groups, which in turn imply a very large share of educational expenditure in total output. Extremely low incomes, on the other

hand, may constrain government revenue so as to virtually preclude full enrollment even in primary schools. The quality of education will also fall short of that available in the higher-income countries. Thus, in analyzing the determinants of the share in gross domestic product (GDP) of public spending on a sector, the level of development (as measured by per capita GDP) seems to place a fundamental limit on possible spending in many sectors. It may also influence the likely balance in spending between the economic sectors, which are oriented toward stimulating current productivity and capital accumulation, and the social and administrative sectors, which aim at providing current consumption. It can be added, furthermore, that, while per capita income constitutes a constraint that limits the total provision of goods and services to satisfy a country's needs, it does not necessarily reflect the degree and the proportion in which these goods and services are provided by the public sector as opposed to the private sector. The division between the public and private sectors may reflect institutional and political considerations as well as the government's capacity to obtain resources through taxation to finance these expenditures.

At a general level it may be hypothesized that the types of goods and services purchased by government expenditure--the so-called economic categories of expenditure--are significantly influenced by sectoral priorities. In any sector there may be a wide range of services, each potentially produced by a host of different technologies. Yet, on balance, the mix of labor, current consumption of other goods and services, and capital goods is likely to be different for each functional sector, so that the economic mix of expenditure will be largely determined by the functional mix. For example, a high share of spending on education is likely to imply a high share of spending on wages and salaries and perhaps on goods and services; similarly, a strong correlation might be expected between the share of spending on economic sectors and public capital formation. In developing predictive norms for appraising the share of spending on different economic categories of expenditures' the functional spending priorities are thus assumed to be the primary determinants.

The determinants of government expenditures in line with the functional classification that were empirically tested by Tait and Heller are summarized in the Table 2.2.

Table2.2 Determinant of Functional Expenditure Categories as Share of Gross Domesstic Product

	General Public Service	Defense	Education	Health	Social Security and Welfare	Health, Social Security and Welfare	Housing and Community Amenities	Agriculture, Foresty, Fisheries	Mining, Manufacturing, and Construction	Electricity, Natural Gas, and Water Supply	Transportation and Communications
Income Per Capita	X			X	X	X		X	X	X	
Percentage of population, aged 14 and under	X	X	X								
Percentage of population, over age 65				X	X	X					
Infant mortality rate					X	X					
Share of labor force in agriculture								X			
Share of labor force in industry					X	X					
Share of population in urban areas	X	X	X								
Enrollment rate, primary schools			X								
Enrollment rate, secondary schools			X								
Pupil-teacher ratio, primary school			X								
Access to clean water supplies				X							
Population per hospital bed											
Poparation growth rate in urban areas											X
Share of total public expenditure in GDP	X										
Share of total public expenditure (net of defense)		X									
Share of manufacturing sector in GDP									X		X
Share of other manufactured goods and fuel exports in total exports									X		X
Share in argriculture in GDP											X

They also use the estimated equation to forecast the average expenditure pattern to calculate the International Expenditure Comparison Index (IEC) as follow:

$$IEC = \frac{\text{Actual government expenditure to GDP ratio}}{\text{Forecasted government expenditure to GDP ratio}} * 100$$

If IEC is greater than 100 implies that the actual expenditure is more than the average pattern of developing countries and vice versa.

As for the study in Thailand Pranee Tinnakorn and Chalongphob Susangkarn (Pranee Tinnakorn and Chalongphob Susangkarn, 1996: 1-47), based on the international data of 45 countries including Thailand, have used the methodology of Heller and Diamond to estimate the equation explaining the government expenditure and using the equation to calculate IEC of developing countries. The variables they used in the explaining equation include both economic and demographic variables as summarized in the Table 2.3.

Table 2.3 Estimates of Influential Factors on Central Government Expenditures of Selected Developing Countries

	Total expenditure	General public services and internal order	Defense	Education	Health	Social security and Welfare	Housing and Community Amenities	Econ Affairs and Services	Fuel and Energy	Agriculture, Forestry, Fishing, and Hunting	Mining, Manufacturing and Construction	Transportation and Communication
Income per head	X	X	X	X	X	X	X	X	X	X	X	X
Income per head square	X	X		X	X		X		X		X	X
Dummy for countries with income per head above US$								X		X		
Proportion of population with age 0-14				X								
Proportion of population with age 15-64											X	
Proportion of population with age over 65					X							
Population density per one sq km							X	X				
Proportion of urban population	X				X	X		X	X	X		X
Proportion of labor force in agriculture			X							X		
Proportion of labor force in industry							X					
Proportion of labor force in services							X					
Share of agriculture in production				X								
Ratio of external debt disbursements to GDP	X	X		X				X				
Dummy for countries in Latin America		X	X							X		
Dummy for countries in Europe							X		X			
Dummy for countries in Latin Africa	X		X	X			X					
Dummy for Sub-Saharancountries									X			

The factors they found significant in explaining government expenditure are per capita income, ratio of population in urban areas, the ratio of foreign loan disbursement to GDP, and dummy variable for different continents. Applying IEC for comparing Thailand's expenditure pattern to other developing countries', they found that except expenditure for military and defense the IEC for Thailand is below or on par with the developing countries. The IEC for Thailand military and defense is around 131, which is significantly higher than the average.

There are also empirical studies on the determinants of government expenditure for specific expenditure particularly capital expenditure, education expenditure, wage and salary expenditure as well as the expenditure for subsidies. Fernandez and Rogerson (1997), for example, have studied the factors affecting public education expenditure in the U.S. using a panel data of the 48 states during 1950-1990. Their study aims to assess the effects of growth in personal income on public primary and secondary education expenditure. Based on a regression equation linking the real expenditure on public primary and secondary education (x_t) to the permanent component of real personal income (y_t) and vectors of demographic variables (d_t) (i.e.

population of school age, fraction of population over 65), the following specification is used:

$$\text{Log } (x_t) = ai+b_1 \log (y_t)+b_2 d_t$$

From the analysis, they found that the coefficient of income is highly significant but the two demographic variables-- population of school age, fraction of population over 65-- are not.

Randolph, Bogetic, and Heffley study factors that influence public investment in transportation and communication infrastructure. Using a pooled cross-national and time-series data for 1980-86 of 27 low-and middle-income economies, their conclusions are:

1. Per capita spending on infrastructure responds most strongly to changes in the level of development, the urbanization rate, and the labor force participation rate.

2. Spending is greater in countries with large foreign sectors and is positively influenced by sectoral imbalances between rural and urban areas (reflected in migration rates). Moreover, as the stock of infrastructure increases, so does per capita spending on it.

3. If the total flows of foreign savings increase, there is a small positive response in per capita spending. The composition of foreign saving alsomatters: when commercial bank flows represent proportionately more of such flows, infrastructure spending is greater.

4. With a higher population density, consolidated government spending declines. Central government spending increases initially, but decreases as population density rises.

5. Central budget spending is positively associated with the institutional development, whereas consolidated budget spending falls as institutional development progresses (i.e. Consolidated spending is higher when levels of institutional development are low).

6. The size of the budget deficit appears not to influence central budget spending but is positively associated with consolidated budget spending.

7. Greater outward orientation is positively associated with increased consolidated budget spending but seems to bear no relationship to central budget spending on infrastructure.

Governments that are completely not committed to alleviating poverty, or that are extremely committed to it, spend less from the central budget on infrastructure. Governments with only limited commitment to alleviating poverty adopt strategies to increase the productivity of the poor by investing in infrastructure. But as their commitment intensifies, their strategy shifts to improving human capital or strengthening the social safety net, and funding for those social programs competes with funding for developing infrastructure.

Schuknecht (1994) examines the impact of elections on economic policy making in developing countries and finds that governments try to improve their re-election prospects by pursuing expansionary expenditure policies. Rising fiscal deficits before elections are followed by fiscal consolidation afterwards. These cycles are found particularly in countries that are less trade-oriented because additional demand does not leak abroad, and in countries that pursue fixed exchange rate policies, perhaps because additional import demand does not trigger a devaluation-inflation spiral. This finding suggests and confirms the importance of taking account of election constraints in macroeconomic projections and policy advice on the design and schedule of reforms. The political commitments to reforms, for example, should be strengthened before elections.

The paper's numerical findings may be summarized as follows:

On fiscal deficits: Regression results show that the overall fiscal balance worsens by over 0.6 percent of GDP over an election period. Deteriorating terms of trade, natural catastrophes, and inward-oriented policies also contribute to larger fiscal deficits.

On revenue and expenditure: Regression results indicate that the election-induced fiscal stimulation translates into increasing government expenditures rather than declining revenues. This finding is crucial in confirming the impact of politic passes more through the expenditure process rather than revenue side.

On the expenditure composition: The estimations show that, prior to elections, capital expenditure rises as a share of both overall expenditure and GDP, presumably to create short-term employment in public works.

On fiscal cycles in various country groups: Countries with flexible exchange rate regimes do not exhibit election cycles, but cycles are very pronounced in countries with fixed rates and adequate reserves. Fiscal cycles over elections occur both when a country has an IMF-supported program and when it does not, which indicates that domestic political constraints dominate international influences. Economies that are not trade-oriented exhibit very pronounced election cycles, while trade-oriented countries show more fiscal stability over election periods.

Krady and Rijckeghem (1995) study the determinants of employment and wages expenditure in the public sector, using a new set of panel data for 34 LDCs and 21 OECD countries from 1972- 1992. The estimating equations follow an efficiency wage model including proxy variables for financial constraints and unemployment. The primary purpose of this model is to illustrate some of the optimality considerations faced by a government forced to choose between employment and wage policy when the labor market is efficient. Further, a question is also raised on how these policies are influenced by fiscal constraints and unemployment. An efficient wage rate framework is chosen because it allows the formalization of the idea that effort and wages are closely linked, especially in the public sector. The paper also compares and contrasts the results of developing countries with those for the OECD countries. The data set includes employment at the central and local government levels and in the public enterprise sector, corresponding annual wage rates, and a number of private sector labor market indicators, such as private sector employment/unemployment levels and rates and private sector wages. The equations are estimated using both country averages and a pooled time-series cross-section with country dummy variables (that is with " fixed effects") to control for differences in definitions and other differences across countries.

The paper finds a significant positive association between government employment and resource constraints (the revenue-to-GDP ratio, and foreign financing in the case of developing countries and GDP per capita in the case of OECD

countries), urbanization, the level of education, and certain counter cyclical pressures for government hiring (namely, the real effective exchange rate for developing countries and the ratio of private employment to the population for OECD countries). A negative association is found between government employment and fiscal federalism. Certain measures of government wages are positively associated with government revenues in developing countries; these measures are negatively associated with the level of education and government debt in developing and OECD countries, and with the real effective exchange rate in developing countries. Structural adjustment programs are associated with lower levels of government employment within countries but have no significant association with wage levels, while stabilization programs are associated with lower wage levels within countries.

In author study, Hewitt (1991) used a public choice model to identify empirically the factors affecting military expenditure in 125 countries.

Econometric analysis of cross-section time series data shows that the ratio of military expenditures to GDP is approximately constant—the ratio increases moderately with GDP at low levels of GDP and is constant at high levels of GDP. The elasticity of military expenditures with respect to per capita income is somewhat greater than one; thus, military expenditures rise more quickly than per capita income.

Several proxy variables for the ability of governments to obtain external financing confirm that military expenditures are reactive to economic conditions. Heavily indebted middle-income countries are found to allocate less to the military. Small low-income economies, which normally have limited financial leverages because of both their low per capita incomes and their small populations, also spend less on the military. Additionally, the net flow of public and publicly guaranteed external financing, which indicates the level of concessional financing available to a nation, has a positive association with military expenditures. The empirical results indicate that external financing increases military spending in two ways. First, financing increases government spending, which indirectly increases military appropriations. Second, external financing induces a shift in the mix of government expenditures toward the military, implying that military expenditures receive a

disproportionate share of external financial resources relative to other budgetary items.

The elasticity of military expenditures with respect to central government expenditures is found to be less than unity. This implies that military expenditures adjust somewhat less than proportionally to central government expenditure changes. Conversely, in the second equation of the simultaneous system employed in this paper, the elasticity of central government expenditures with respect to military expenditures is found to be close to the average ratio of military expenditures to central government expenditures. This result implies that autonomous increases in military spending, on average, are accommodated by an approximately equal increase in central government expenditures rather than a crowding out of other government activities.

The model indicates that the form of government alsoaffects the level of military expenditures. Countries involved in an internal or external conflict tended to spend more on the military. For country not engaged in war, other things being equal, monarchies spend the most, followed by military governments and socialist governments. Countries governed by multiparty democracies tend to spend the least. Geographical variables, such as land area and border length, are also found to have a significant effect on the level of military expenditures.

Hewitt and Rijckeghem (1995) study Wage Expenditure of Central Governments. This paper provides estimates of the impact on central government wage expenditures of 1) institutional factors that influence the level of decentralization of government; 2) the availability of resources; 3) Fund- supported programs; and 4) preference-related variables. These estimates provide a basis for comparing central government wage expenditures across countries in the tradition of Tait and Heller (1982) as previously reviewed and possibly for identifying government productive inefficiency or an ambitious set of central government objectives.

Empirical investigation using cross-country time series is carried out based on a simple model of public choice, which suggests a two-equation recursive system consisting of a total expenditure and a wage share equation. The estimation procedure

takes account of the possible bias resulting from correlation between the errors of the total expenditure and the wage share equations. The data span 1980-90 and cover 99 countries.

The paper has five main findings. First, federations and countries with large populations-which are viewed as proxies for fiscal decentralization—have lower central government wage expenditures as a percent of GDP. In addition, central government wage expenditures appear to decline with per capita income, presumably because decentralization and also human capital increase with economic development. Second, general government wage expenditures appear to increase with per capita income, as indicated by a comparison of industrial countries and developing countries for which general government data are available. Third, the paper finds that private non guaranteed foreign financing is associated with higher central government expenditures and, indirectly, with higher wage expenditures. Public and publicly guaranteed net financing, provided often for public sector capital projects, are associated with higher total government spending but have only a marginally significant association with mage expenditures. Fourth, medium-term structural adjustment programs, which often include civil service reform measures, have a significant negative association with wage expenditures, while short-term stabilization programs, which do not include such measures, do not. Fifth, there appear to be systematic differences in expenditures on wages across forms of government. Wage expenditures are lower in socialist countries than in democracies, probably because government employees in the former countries receive a large portion of compensation as in-kind benefits. These findings can be used to put countries with diverse characteristics on a comparable basis. They do not necessarily carry policy implications and do not lead to the conclusion that certain forms of government are preferable from the point of view of fiscal consolidation.

The model proposed by Hewitt and Rijckeghem was adapted to study the economic determinants of government subsidies by Clements, Rodriguez and Schwartz (1998). The paper provides an empirical analysis of economic determinants of government subsidies. A simple public choice model is developed and econometrically tested using panel subsidy data from the United Nations System of

National Accounts. The paper finds that the data are a reasonably good proxy for a more comprehensive measure of subsidies. The econometric results from testing the fixed-effect representation of the structural model indicate that the size of a government has a significant bearing on subsidy expenditures, with each percentage point increase in the government spending to GDP ratio leading to about a four-tenths of a percentage point increase in the ratio of subsidies to GDP. The results also reveal that government subsidies are comparatively higher in countries with high ratios of government interest expenditure to GDP, large manufacturing sectors, large external current account deficits, and a low degree of urbanization. The degree of openness, the dependency ratio is found to have a statistically insignificant impact on subsidy expenditures. An interesting aspect of the results is that they suggest that globalization and the associated increase in economic openness are not impediments to reducing subsidies; countries that have opened up have not, on average, been forced to use subsidies to address any of the social costs associated the greater exposure to international trade.

Annett (1982) explores relationship of the degree of division or fractionalization of a country's population with both political instability and government consumption using a neoclassical growth model. Specifically, higher fractionaiization is held to lead exogenously to greater political instability. Partial insurance against the political risks engendered by the instability can be bought by raising level of government consumption. The reduced form evidence shows a strong positive relationship between fractionalization and government consumption, although it was noted that such a result was also consistent with an alternative hypothesis, that is associated with a common pool model in which differing groups act in a non cooperative manner and over consume by seizing resources from the government. This paper shows that endogenizing political instability is crucial and that once a system with two endogenous variables is estimated, it becomes clear that the effect of fractionalization on government consumption is indirect, via the political instability channel. Furthermore, it is clear that governments use government consumption as a buffer against political instability. One lesson to be drawn from this paper is that it is possible for a country to reduce the level of instability, even if the

country is divided into competing groups. This involves the use of government consumption. Permitting a government to increase its consumption will reduce the level of instability, even if the country is divided into competing groups. Furthermore, numerous researchers have pointed out that political instability is detrimental to growth.

By reviewing the relevant studies in the literatures it is found that in terms of theoretical considerations various theories and hypotheses have been proposed and found reasonably plausible in explaining the government expenditure. The empirical studies, which actually apply these theories to the real world, however, are few. Most of these studies focused on the cross section analysis using data from many countries at a given period of time. There have been virtually no time series analyses on a specific country using a long historical period since the study in the UK by Peacock and Wiseman (1967). In short, the relevant literature could thus be summarized in the table 2.4.

Table 2.4 Literature Review

Theoretical Consideration	Empirical Investigation
Wagner Hypothesis	Wagner, Musgrave, OECD
Displacement Hypothesis	Peacock & Wiseman
Welfare Theory (Marginal Utilitarian Approach)	—
Public Choice	WB, IMF (cross country analysis)
Incrementalist	—
No specific theories explicitly stipulated (but they try to link to social, politic, demographic variables)	Tait, Heller, TDRI (cross country analysis)

2.2 Theoretical Framework

The prospect, focus, data and methodology of this study differ from those studies reviewed above in a number of important aspects:

1. The nature of this thesis is an explanatory research, which aims to explain behavior, pattern, development as well as determinants of the government expenditure in Thailand. The thesis is based on time series analyses since it is possible for long periods of data can be collected, analyzed, characterized and explained by a set independent variables. The hypothesized structure of models and the choices of independent variables in some cases are derived from a freshly developed model, while others are derived from the previous studies based on the hypotheses formulated in this study. It should also be noted that, based on the literature review conducted, research of this kind has never been performed in the case of Thailand's government expenditure. In the international sphere, since the work of Peacock and Wiseman on the public expenditure in United Kingdom, this kind of research has rarely been done to explain time series development of government expenditure in a specific country.

2. Most of the recent studies reviewed in the previous section are cross sectional and cross country pooled data analyses rather than focusing on any one specific country. This is mainly due to the fact that:

First, time series analysis of a specific country requires an extensive period of analysis to ensure that the findings of conclusion are robust. Data over a period of say 50 years, is hard to come by in a complete form in the case of developing countries where the data collection is not yet fully developed. As a result only the research of this kind could only be performed in a country with a good database such as the United Kingdom and United States.

Second, a specific country analysis requires researchers to have a good background information on the systems of budgeting, politics, economics and society as a whole in the country under study, which is normally left in the hands of native researchers.

Third the potential benefits of this kind of study are probably not as great (in terms of applicability etc.) as the cross-country research. This is why researchers of international organizations tended to focus on the international comparisons and cross-country analyses.

Fourth, a specific country analysis probably permits a lower degree of generalization, when compared with the cross-country analysis.

However, in the case of Thailand, it is felt that the background and knowledge of this kind are quite useful. Though not completely generalizable, the results of this study should help us to understand the phenomena of our own country, and help policy makers to proceed in the right direction like all other researches on public policy.

3. The sets of independent variables explaining the pattern of government expenditure could vary somewhat. The variation of the social, political and demographic variables in the cross-country studies can be easily observed and tested empirically. For a time series analysis, however. these variables tend to be stable in the short run, despite exhibiting some changes in the longer term. The explanation variables that were found significant in the cross-country studies may be not

necessarily apply in the case of a time series analysis. These independent variables thus have to be refined to fit the time series nature.

4. Although some of the frameworks and analytical tools in this study are derived from economic field, the core of this thesis is based on policy analysis. The employment of tools from other fields (such as economics) which are more advanced quantitatively to enhance and articulate policy analysis should contribute to the advancement of knowledge in this field.

2.2.1 Theoretical framework

It cannot perhaps be over-emphasized that the main purpose of this study is only to present facts and use them to explain the behavior of Thailand's government expenditure with reference to the basic propositions. These propositions postulate about the characters of government and relate them to the facts and events in history particularly these economic factors, which are hypothesized to be the determinants of government expenditure. The following is an outline of the methodology designed to achieve the objectives on page three:

1. The investigation is based on data dated as far back as 1960, including documents on economic and political developments pertinent to the government expenditure policy. Then, a set of statistical tools are used to describe the intertemporal pattern of government expenditure along with a number of other relevant variables including Gross Domestic Product (GDP) during the same period. The relationships linking government expenditure, as well as its compositions with GDP will be postulated, estimated and, analyzed, to see how their evolution over time, supplemented by other qualitative data such as political conditions and economic crises.

2. Next, a more elaborate empirical model is developed and tested using government expenditure data during 1970-1999 based on a set of assumptions.

In particular, in this study, it is assumed that government expenditure is not exogenously determined or taken at random or in an unpredictable manner as might normally be proposed by 'conventional' economic studies, but rationally guided by self-interests and by the governments' perceptions of the state of the economic and social conditions. This assumption is in line with studies in the literatures especially

the theses by Dye 1976, and Mostly 1984. Implicit in this model, thus, are the assumptions that government's policy cannot be made in a vacuum as proposed by Dye, but interrelated to a set of economic and political conditions. Furthermore, inherent in this model is also the belief that any conclusion drawn would be misguided unless the behavior of these policy variables is incorporated into the model, as suggested by Mostly.

This model is based on the welfare function framework adapted from the studies by Hewitt 1991, Hewitt and Rijckehem 1995 and Clements, Rodriguez and Schwartz 1998. Since the previous models cover only the expenditure for wage and subsidies the framework has to be expanded to include capital and other current expenditure never been done before. According to the government welfare function, the government will select an economic policy (including government expenditure policy) so as to maximize its own welfare, subject to constraints. As discussed by Clements, et al. (1998), this optimization nature of the government does not mean that the government will peruse only its own self- interest. It certainly has to be aware of the public well-being. Thus, the welfare function as perceived by the government can be expressed in the following function:

$$W = W(UPDD, UG, UO, S) \qquad (1)$$

Where:

W = welfare of the government

UPDD = utility derived from consumption and investment of private sector (or private domestic demand)

UG = utility derived from pursuing economic growth

UO = utility derived from pursuing other objectives such as increasing public wages and salaries to elicit the support from the bureaucrats, or subsidies and transfer payments to redistribute income etc.

S = the country's condition indicators that could affect the government's welfare or popularity.

Theoretically, UPDD, UG and UO should be positively related to W. It is conceivable that given a level of UG, UO, and S, government will gain more utility by increasing the level of private economic activities either through private consumption

or private investment. These private consumption and investment will, in turn, increase welfare of the people which adds on to the government welfare function directly and indirectly. Since the government will also become happier by enhancing private activities, it is not totally self-motivated. Indirectly, prosperity of the private sector will increase the government's popularity.

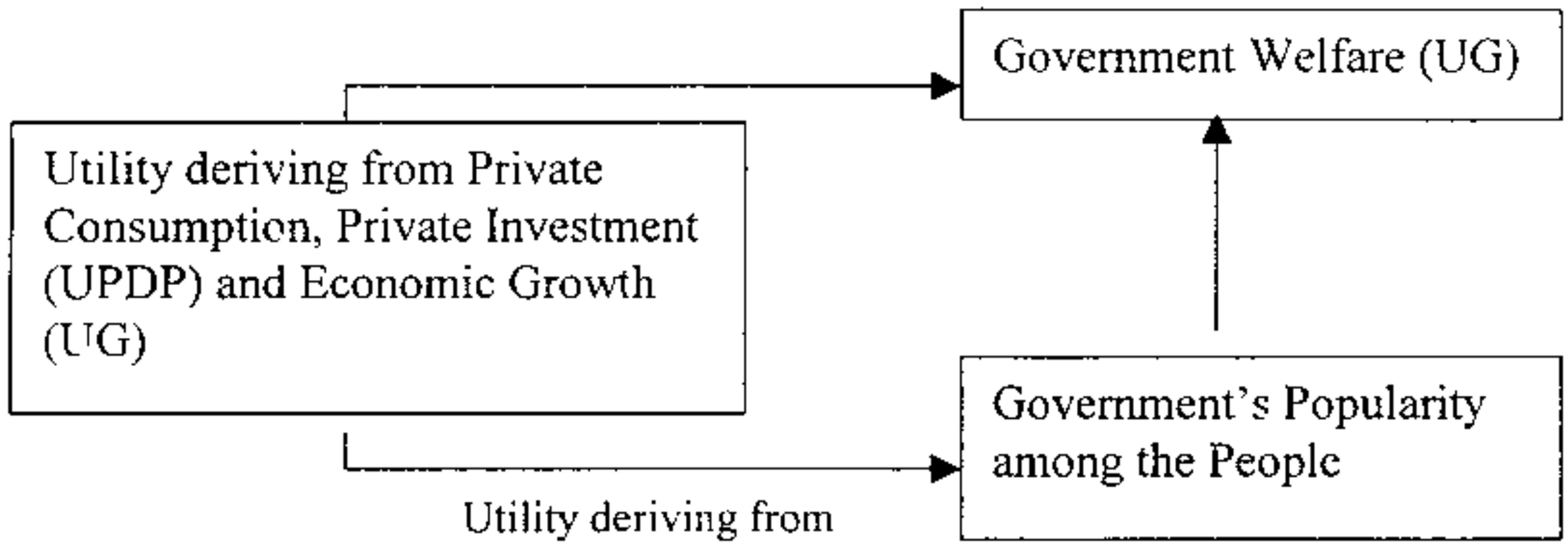


Diagram 2.2 Private Activities and Popularity to Government Welfare

This process is also true in the case of economic growth (UG). Given an economic growth, driven by either government expenditure, private consumption or investment, or exports the national wealth will be augmented. With growing wealth, government's popularity among the people will rise, adding on to the government satisfaction.

As a result, a rational government wanting to maximize its own utility will pursue a policy to promote either the private consumption, investment or overall economic growth. The relationship between UPDD and UG is thus clearly positive. The relative importance between these two factors, however, will depend on the policy decisions and the implicit or explicit weights the government give to the respective factors. (The linkage between UPDD and UG to the government welfare are illustrated in Diagram 2.3)

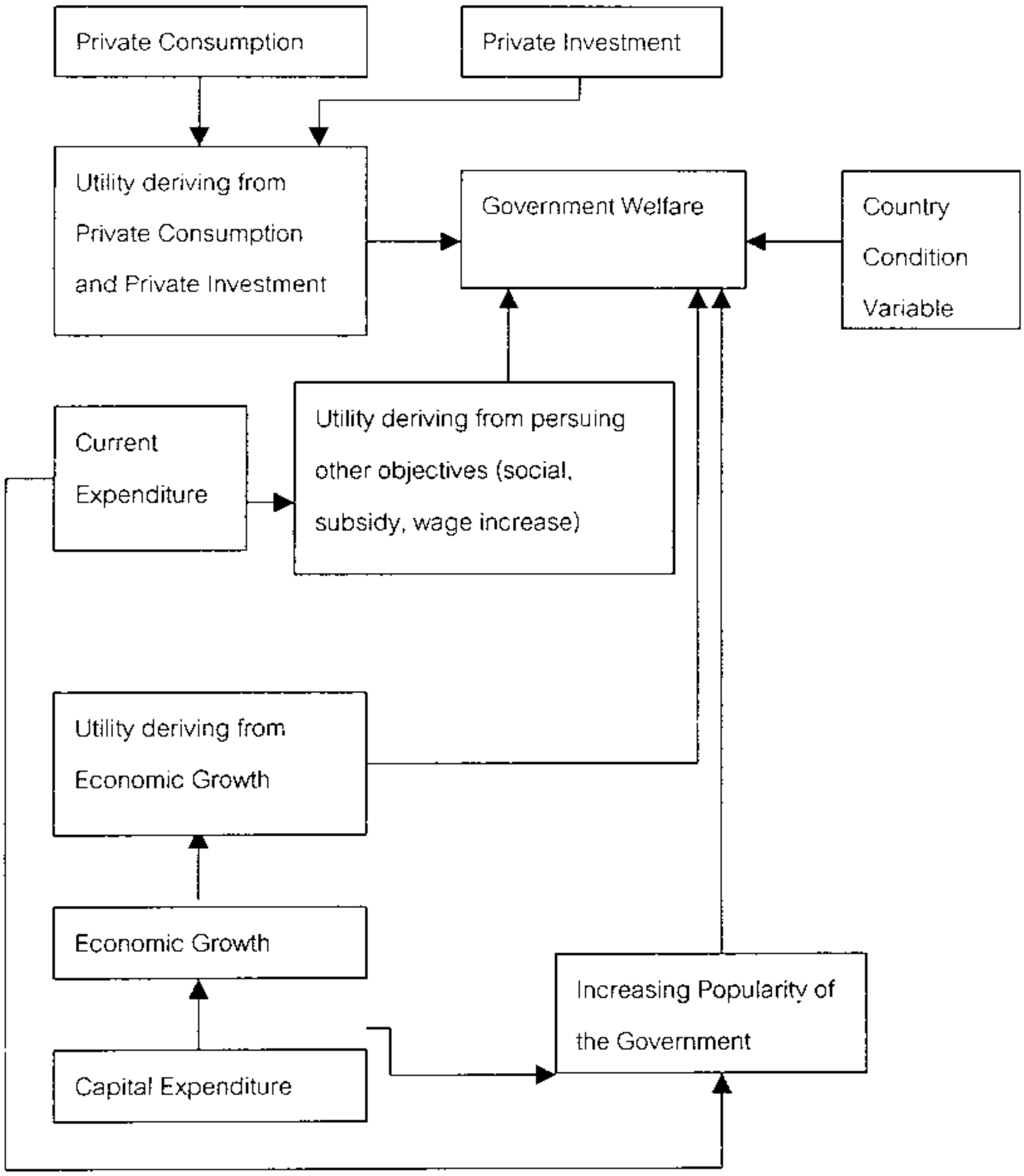


Diagram 2.3 Factors affecting Government Welfare

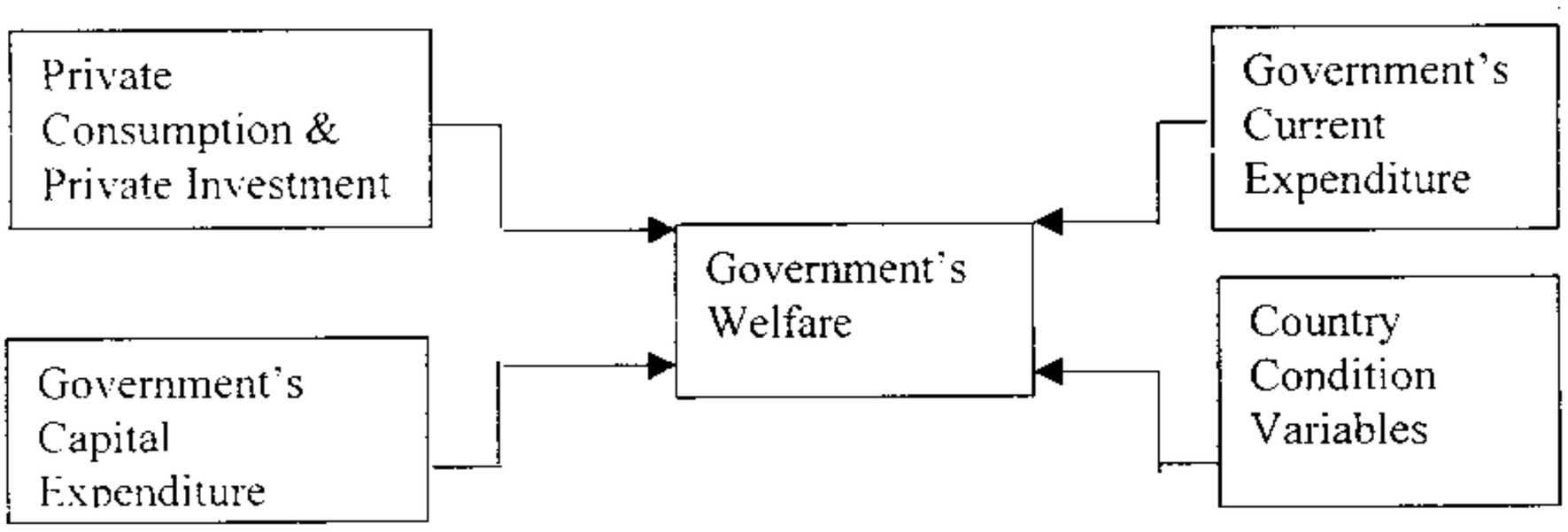


Diagram 2.4 A Summary of Diagram 2.3

Since S depends on the nature of the state variables, it will be discussed in detail later. For the other subcomponents of the model, each may be explained further by a set of variables as shown in equations (2) to (4).

$$UPDD = UPDD\ (PDD, S) \qquad (2)$$

PDD = Private Domestic Demand

As already mentioned, the link between UPDD and PDD may be interpreted as the more goods and services are generated and consumed or invested by the people, the more welfare of the government will be.

$$UG = UG\ (GCAP, S) \qquad (3)$$

Where:

GCAP = Government Capital Expenditure

Further, the government capital expenditure is assumed to be critical for a sustained economic growth, the relationship between them is expected to be positive.

As for utility derived from other objectives, the relationship maybe written as:

$$UO = UO\ (GCUR, S) \qquad (4)$$

Where:

GCUR = Government current expenditure consists mainly of the wages and salaries, subsidies, transfers, and interest payments.

For this study, the interest payments are excluded from the current expenditure. Here, it is assumed that the government will attempt to allocate its expenditure to fulfill the equity and other social objectives through transfer payments and subsidies. The wages and salaries are also assumed to be a tool of the government in seeking supports from the bureaucrats. The current expenditure is therefore expected to be positively correlated with the utility function.

On constraint side, the government is assumed to manage its expenditures within two limits as follows: CONSTRAINT 1:

$$TE = GCAP + GCUR + INT \qquad (5)$$

Where

TE = Total expenditure;

INT = Interest payments

The first is the budget constraint. After paying for interest payments (INT), which normally assume top priority, the remaining expenditure will be allocated between the government current and capital expenditure. The second constraint is the national resources availability constraint. It is constrained by the Gross Domestic Product (GDP), Private Domestic Demand (PDD), (consisting of the private investment and private consumption), and foreign savings. The foreign saving is represented by the current account balance. A deficit on the current account means that the country has to borrow savings from abroad to finance the government and private demand. Therefore, a deficit in the current account allows government expenditure to expand beyond its own resources limits. To derive the second constraint, first the national income identity may be written as:-

$$GDP = GCAP + GCUR + INT + PDD + X\text{-}M \qquad (6)$$

Where X represents exports of goods and services and M for imports of goods and services. The X-M is the current account balance (CA), and the GCAP+GCUR+INT is equal to the Total Government Expenditure or TE. Therefore, this equation can be introduced as the second constraint in the model as follows.

CONSTRAINT 2:

$$TE = GDP\text{-}CA\text{-}PDD+INT \qquad (7)$$

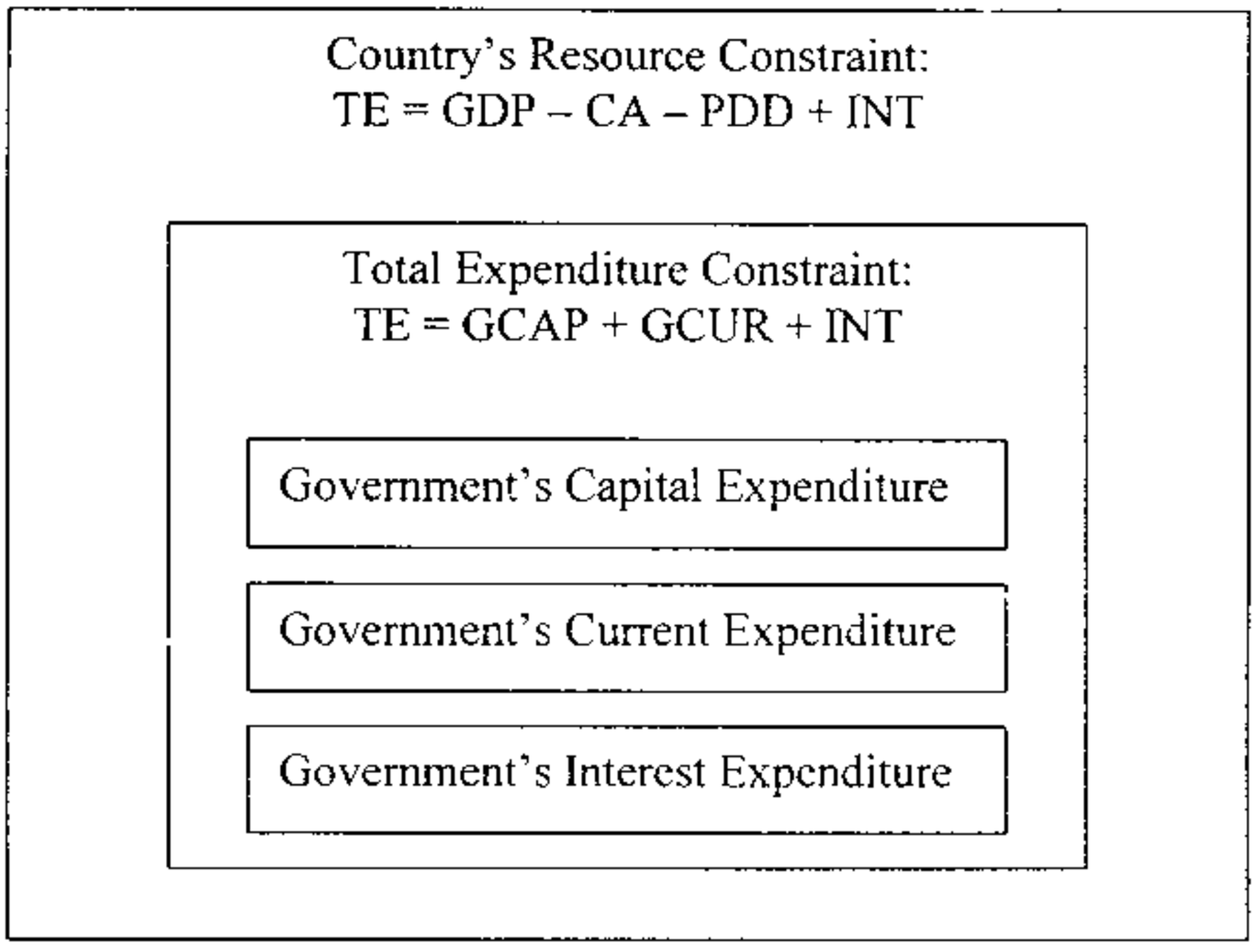


Diagram 2.5 Constraints of Government to the Increased Expenditure

By substituting the equation (2), (3) and (4) into the (1), the welfare function may be written as a function of the private domestic demand, government's capital expenditure and government's current expenditure as follows:

$$W = W(PDD, GCAP, GCUR, S) \quad (8)$$

Subject to two constraints:

CONSTRAINT 1:

$$TE = GCAP + GCUR + INT$$

CONSTRAINT 2:

$$TE = GDP\text{-}CA\text{-}PDD+INT$$

In formulating policies, a rational government will try to maximize its welfare through the following steps:

1. Try to increase both capital and current expenditures as much as possible to increase government's welfare

2. Subject to the constraints by

2.1 Own resources or the government's total expenditure. As interest expenditure increases, the own resources available to other government's activities become less.

2.2 The national resources. As the government increases its expenditure beyond the national limits, it has to borrow from aboard. The resources available through this channel will, on the other hand, depend on how much the country can produce (GDP), and how much the people in the country consume. The proportion of resources left after private demand will become available for government to spend on its capital and current expenditure. If the government spends more than that portion, again it will have to borrow from other countries. Then, the government's limits to spend will depend on its ability to borrow from abroad. In reality, this ability to borrow is quite limited. A government can not go on borrowing forever. Beyond a certain point, the borrowing is no longer available due to the eroded credibility of the government.

3. A rational government therefore tries to spend and allocate its resources to the capital and current expenditure within the constraints posed by the amount of resources available.

In summary, the budgetary process under the welfare function presumption may be illustrated as in Diagram 2.5.

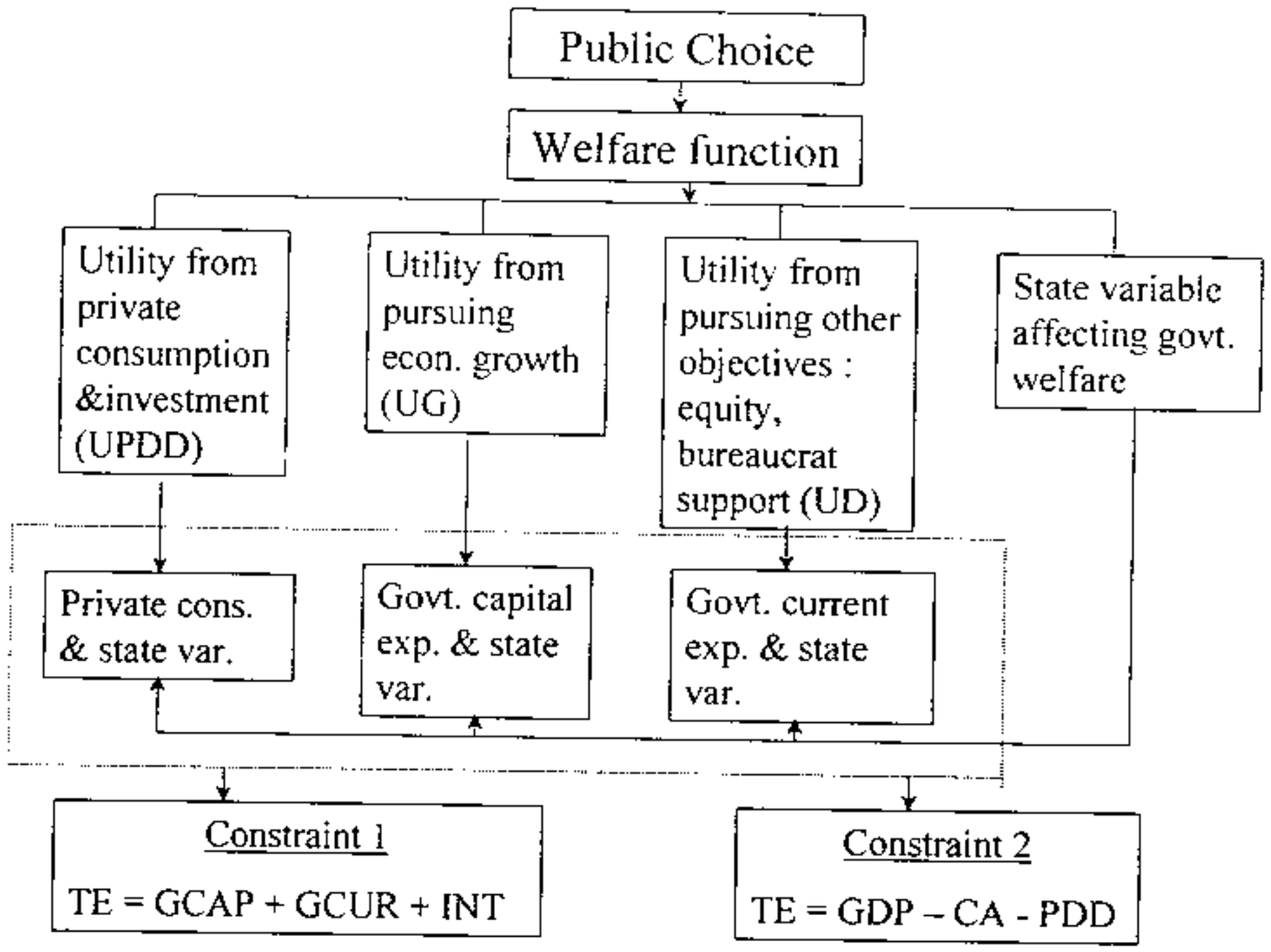


Diagram 2.6 Welfare Function and Government Expenditure

For simplicity, it may be assumed that the welfare function in (8) can be approximated by a Cobb-Douglas utility function as:

$$\text{Max } W = E\ PDD^{a}\ GCAP^{b}\ GCUR^{c} \qquad (9)$$

Where E is the constant term and a, b, c are the coefficients that represent the relative values in the welfare function of private domestic demand,the government capital and current expenditure respectively. The government's optimization problem is thus narrowed down to three variables, PDD, GCAP, and GCUR. This optimization problem may then be expressed in the form of a Largrangian equation as follow:

$$\text{Max}W = E\ PDD^{a}\ GCAP^{b}\ GCUR^{c} + d(GCAP+GCUR+INT)+ e\ (GDP-\ CA-\ PDD+INT)$$

Where d and e are the Lagrangian multipliers that represent the relative values of the two constraints. Using the Largrangian approach (the method is described in

detail in Hewitt 1991, Walters and Rayard 1978), the solution to the above equation can be found as shown in the following three equations:-

$$\frac{GCAP}{GDP} = GCAP\,[(TE\text{-}INT)/GDP, S] \qquad (10)$$

$$\frac{GCUR}{GDP} = GCUR\,[(TE\text{-}INT)/GDP, S] \qquad (11)$$

$$\frac{TE}{GDP} = te\,[(INT)/GDP, CA/GDP, S] \qquad (12)$$

2.2.2 Incorporating of the incrementalist variables

The equations (10) to (12) are derived based on the public choice theory whereby the amount of the government expenditure is mainly determined by the remaining expenditure after interest payment (TE-INT), the size of interest payments over GDP and the other relevant conditional variables. The advantages of these equations are:

1. They focus attention on the importance of the interest payments, which are a product of debt accumulation. This equation is therefore helpful in predicting how the government expenditure will develop after a big hike in public debt such as after a major crisis.

2. These equations are also flexible in that any environmental variables may be incorporated through the conditional variables, as deemed appropriate to the economic, social and political dimensions. This flexibility will contribute to the enhancement of the explanatory power of these equations.

As incrementalist variable, is normally represented by a one-lagged variable of the respective government expenditure category deemed critical to the government's decision in setting its budget. Underlying this model is the assumption that policy makers will tend to accept the policies of the past as satisfatory and legitimate due to: first, the existing policies still have sunk costs that would possibly be impossible to retrieve if a new radical course of policy were to be taken, e.g. the heavy investments in existing programs, precluding any radical changes; second the uncertainty or risks

inherent in the introduction of a new policy; finally the political expedience will be lost if the whole process has to be re-initiated all over again. As a result, the current period's level of expenditure is in a way determined by its previous period's. According to the incrementalist school, the public policy in particular the government expenditure policy tends to build on a continuum of past government activities with only incremental modifications. The previous year's government expenditure is thus considered to be a base. Based on this model, the incrementalist hypothesis may be tested by including an additional variable representing the previous year's government expenditure in the equation. Once the empirical results are statistically verified, the significant of the coefficient of the previous period's government expenditure may be used to indicate whether incrementalist is able to explain the government expenditure behavior in Thialand.

The equation (10, (11) and (12) augmented by the incrementalist hypothesis can thus be written as:

$$\frac{GCAP}{GDP} = gcap\ [(TE\text{-}INT)/GDP,\ \frac{GCAP_{T-1}}{GDP_{T-1}},\ S_1] \qquad (13)$$

$$\frac{GCUR}{GDP} = gcur\ [(TE\text{-}INT)/GDP,\ \frac{GCUR_{T-1}}{GDP_{T-1}},\ S_2] \qquad (14)$$

$$\frac{TE}{GDP} = te\ [(INT)/GDP,\ CA/GDP,\ \frac{TE_{T-1}}{GDP_{T-1}},\ S_3] \qquad (15)$$

CHAPTER 3

METHODOLOGY

From the end of the previous chapter, the equation (13), (14), (15) with fully identified conditions variables will be estimated and tested for their explanatory power of the real world. Specifically, the equations (13) and (14) propose that the government expenditure for current and capital should increase in line with the total government expenditure less interest. The equation (15), on the other hand, can be interpreted that total government expenditure would tend to increase with interest expenditure. Given that once the government has continually accumulated debt, and interest payment have begun to pick up the economic and political needs for other expenditure will be out of necessity force the total government expenditure to raise more or less in line with the interest payment. This interpretation if confirmed by the empirical data is very important as it suggests that there is a very low elasticity of one category of expenditure with respect to other categories of expenditures in offsetting a shock. For example, as a consequence of a financial crisis, leading to a big jump of government debt, the size of government will expand multiplicatively. Further, government revenue can not keep up with the increase of expenditure, more debt will accumulate contributing to higher interest payment and an even bigger size of government in a vicious spiral. In this study the effect of interest payment will thus be scrutinized. The empirical findings on the interest expenditure impacts will be fully discussed in the next chapter with a particular aim to see how the past governments reacted to hiking interest payment.

Another important implication of equation (15) is the impacts of government size on the current account deficit. The deficits in current account reflect financial resources (by borrowing abroad) available to finance private as well as public government expenditure. This relationship is an important basis for policy analysis in macro economic management. A country facing the current account deficit, for example should according to this identity consolidate its government expenditure to

narrow current account imbalance. Resources influx from abroad, on the other hand, will tend to lure the government into running deficit. If policy makers overlook this issue, the country may spiral into a double deficit syndrome ie. current account as well as budget deficits.

3.1 Conditions Variables

The conditions variables (S_1 to S_3) in equations (13), (14), (15), represent economic and demographic dimensions that may affect the relative weights the government attaches to various objectives. Some conditions variables may affect the total expenditure rather than its composition, while others may affect the relative important of the current to capital expenditure. According to Tait and Heller (1982), these variables may be classified into 6 main groups: demographic, sociological concerns, economy structures, levels of economic development, technical factors, and environmental factors. According to this proposition, demographic variables are likely to be the key determinants of the demands for government services. More specifically, these include shares of school aged children, proportional elderly people, life expectancy, population growth, and urbanization. The sectoral structure of an economy also plays a critical role in shaping public expenditure policy. In addition, at low levels of economic development, the desire to restructure the economy may stipulate government expenditure in the sectors that are believed to promote the economic development. These demographic and economic variables will be included in the empirical equations. The other variables, which are difficult to quantify included in the empirical equations through a set of dummy variables. The discussions on these empirical results are presented along with the qualitative aspects in the next chapter. The in-depth discussions beyond mere empirical analyses are necessary to close any loopholes or shortcoming of the models. Before proceeding through theses steps, the conditions variables to be incorporated in the empirical equations are first discussed below.

3.1.1 Degree of openness

As suggested by Hewitt (1991), there may be a positive correlation between the size of the government, as measured by public expenditure over GDP, and the

degree of openness of the economy, as measured by total foreign trade (exports plus imports) over GDP.

This relationship probably reflects the needs for government's intervention in alleviating external risks. Accordingly, government expenditures are expected to increase with the degree of openness. In the case of Thailand, governments have played relatively limited roles in the economy, accounting for less than 20 percent of the GDP. In addition, the past governments have more often than not stated either explicitly in the medium term national plans or in their occasional declarations to the parliament that they would pursue policy to enhance private participation. As a results the roles of the government role in the economy, reflected in the size of government expenditure, should also limited in the case of Thailand. In this case, it is thus interesting to test whether the argument as proposed by Rodrik and Hewilt holds. In the case of Thailand against the evidence suggested in the literature, it may be postulated that once the degree of openness increases by the private sector, the government's role will decline, which will be reflected in negative relationship between the size of the government and the degree of openness of the country.

3.1.2 Value added in agriculture (relative to GDP)

This variable is intended to capture the fact that, traditionally, agriculture is a highly subsidized sector. The subsidy may be in the form of either direct subsidy as government actually intervenes to support agricultural product prices or indirectly through hiring of officials to give the advices to the farmers. Hence, a positive relationship may be expected between government current expenditure and the share of agricultural value added in GDP.

3.1.3 Dependency ratio

This variable is defined as in the study by Songtum Pinto (1994) as the share of citizens younger than 15 years and older than 60 years old relative to the working-age population (15 to 60 years old). In most countries, an increase in the dependency ratio should imply a corresponding increase in government expenditures particularly for education, health care, and pensions etc. However, an increase in the dependency ratio also implies a smaller share of the population that pays taxes, which, in turn,

could create pressures to decrease expenditures. In other studies, however, this variable is used sometimes as a proxy for the level of development of the country, the interpretation of which would be somewhat different from the statements above.

3.1.4 Population growth and urbanization

Population growth rate is a major determinant of the share of public expenditure. As the rate of population growth generates direct changes in demographic factors, corresponding shifts (with some lags) can certainly be expected in expenditure for education, health and particularly expenditure for the senior citizens. For example, following the baby boom of the past war period, demand for schools rose sharply, hence placing a major burden on government expenditure for education. If the trend continues, demand for housing facilities will naturally follow as these children become of age. This also implies more fiscal burdens for health care and pensioners' catering expenditure in the near future (Musgrave and Musgrave, 1989).

Similarly, the trend towards urbanization would also lead to congestion problem which has to be addressed, through expanded infrastructure and public services (Musgrave and Musgrave, 1989). These urban areas also need infrastructures that cannot be satisfied by conventional facilities. For example the conventional mass transit such as buses will not be adequate for massive demands of the people in big cities. These unique demands call on the government to invest in the new means of transportation such as underground and sky trains. Urbanization in addition generates various forms of pollution particularly in the congested areas, triggering demands for amenities which have to be met by the government investment.

These dimensions are captured by the population density as defined in Songtum Pinto (1994). In terms of hypothesis testing, a higher degree of urbanization may imply a higher demand for new services from the public sector, so that government expenditures may increase. However, if economies of scale in providing public services were to dominate government expenditures as a proportion of GDP may fall unexpectedly with urbanization.

3.1.5 Value added in manufacturing (relative to GDP)

This variable is intended to capture the generally accepted fact that manufacturing is often more intensively in need of infrastructure than other sectors. Hence, the sign of the coefficient on this variable is expected to be positive and more responsive in the capital expenditure equation than those of current and total expenditure.

3.1.6 The dummy variable

To represent the quantitative aspects of the policy changes and crises during the period of study a number of dummy variables will be used. Since the impacts or exact magnitude of some historical events such as economic crisis cannot be quantified, the uses of dummy variables will thus help to capture any structural breaks that may have taken place during the period of analysis.

3.1.7 Growth of per capita income

Economic development is believed to have considerable impacts on the level of public expenditure. Before a developing country can advance into an industrial stage, it has to invest substantially in transportation, water and power supply, sanitation, education and other infrastructures to reach a 'take off' point. In this early stage of development, a significant share of investments needs to be provided by the government, since the projects do not offer any foreseeable return to investors (Rostow, 1960). After industrialization and advancement to a higher stage of economic and social development, even if private investments expand market imperfection may still warrant government's intervention giving rise to a further increase in government expenditure. Growth of national income is thus expected to correlate with government economic activities, as Wagner had argued that an increase in national income would tend to result in corresponding rise in government expenditure welfare purposes (Musgrave and Musgrave, 1989).

3.2 The Decomposition of Variation in the Dependent Variables

The dependent variables of the equations (13), (14) and (15) may alternatively be subdivided into more specific categories of expenditures. Here six more specific types of government expenditure will be investigated:

1. The expenditure for economic affairs (E-AFFAIR)
2. The expenditure for education (EDUCA)
3. The expenditure for health (HEALTH)
4. The expenditure for goods and services (GOODS_SERV)
5. The expenditure for social and welfare (SOCIAL_WELF)
6. The expenditure for wage and salary (SOCIAL_WELF)

By adding these new six equations to the three aforementioned equations, nine final equations to be estimated are as follows:

$$\frac{GCAP}{GDP} = gcap\ [(TE\text{-}INT)/GDP,\ \frac{GCAP_{T-1}}{GDP_{T-1}},S_1] \quad (13)$$

$$\frac{GCUR}{GDP} = gcur\ [(TE\text{-}INT)/GDP,\ \frac{GCUR_{T-1}}{GDP_{T-1}},S_2] \quad (14)$$

$$\frac{E\text{-}AFFAIR}{GDP} = gcap\ [(TE\text{-}INT)/GDP,\ \frac{E\text{-}AFFAIR_{T-1}}{GDP_{T-1}},S_4] \quad (15)$$

$$\frac{EDUCA}{GDP} = gcur\ [(TE\text{-}INT)/GDP,\ \frac{EDUCA_{T-1}}{GDP_{T-1}},S_5] \quad (16)$$

$$\frac{HEALTH}{GDP} = te\ [(INT)/GDP,\ \frac{HEALTH_{T-1}}{GDP_{T-1}},S_6] \quad (17)$$

$$\frac{SOCIAL_WELF}{GDP} = gcur\ [(TE\text{-}INT)/GDP,\ \frac{SOCIAL_WELF_{T-1}}{GDP_{T-1}},S_8] \quad (18)$$

$$\frac{GOODS_SERV}{GDP} = gcap\ [(TE\text{-}INT)/GDP,\ \frac{GOODS_SERV_{T-1}}{GDP_{T-1}},S_7] \quad (19)$$

$$\frac{WAGE}{GDP} = te\ [(TE\text{-}INT)/GDP,\ \frac{WAGE_{T-1}}{GDP_{T-1}},S_9] \quad (20)$$

$$\frac{TE}{GDP} = te\ [(INT)/GDP,\ CA/GDP,\ \frac{TE_{T-1}}{GDP_{T-1}},S_3] \quad (21)$$

The S1 to S9 in the equations 13-21 must be chosen in accordance with the respective dependent variables. For example, for the economic affair expenditure equation the conditions variable (S4) assigned to this equation may arguably be the value-added share of manufacturing in GDP sector because manufacturing sector is the most intensively in need of infrastructure such as transportation, electricity, water supply and environmental sanitation. It may thus be expected that the value added of

manufacturing sector would play a significant role in determining the allocation of economic affairs expenditure. As a general principle, more than one conditions variable can be simultaneously incorporated into each equation if the additional condition variables are deemed critical to the dependent variable. In this case, the S4 can be represented by S4a, S4b and so on. Inclusion of any conditions variables, however, is not arbitrary. It should be based on some rationale either economically, politically or socially based on the relationships postulated to link to the dependent variable. Statistically, the number of explanatory variables that can be incorporated in the estimated equations will be constrained by the number of data in the period of analysis net of the number of parameters estimated or the degree of freedom. The lower degree of freedom, the less the probability of the estimated equation can explain the dependent variable with high statistical significance. Moreover, the various independent variables may correlate among themselves, making it difficult to segregate the impact of one explanatory variable from another's. This is so-called multi-collinearity problem. In practice, researchers may eventually have to drop some independent variables from an equation to overcome the multi-collinearity problem. From the perspective of the present study, potential multi-collinearity problem will help to prevent the model from being over-extended i.e. having too many explanatory variables.

3.3 Selecting the Appropriate Conditions Variables

The selection of an appropriate set of explanatory variables is critical to the significance of the estimation results. Choosing the wrong conditions variables will obviously lead to either statistically insignificant results or misinterpretations.

The choice of the conditions variables in this study will thus be made carefully equation-by-equation. In some cases, an equation may be estimated twice or more using different conditions variables fixing all other independent variables. Through a thorough process of trial and error, equation with the best statistical results as well as complying with theoretical and practical plausibility are chosen and reported.

3.3.1 Defining the conditions variables in the capital expenditure equation

Given the dependent variable in equation (13) is the Government Capital Expenditure to GDP, there are three potential conditions variables for this equation with intuitively distinguished influence to the allocation of capital expenditure. First, the value added of the manufacturing sector (MANUV) should have direct and significant impacts on the government's decision to allocate resources to capital expenditure. As already mentioned, manufacturing sector is probably the most intensive utilizer of infrastructure. Further, in economic classification of public expenditure, infrastructure are classified as capital goods, with long-lives of more than one year. The share of value-added of manufacturing sector in the economy should therefore be a good conditions variable for the government capital expenditure.

The second conditions variable considered for government capital expenditure is the degree of openness. As suggested by Rodrik (1996), Hewitt (1991), there is likely to be a positive relationship between the size of government, as measured by public expenditure over GDP, and the openness of the economy, as measured by total foreign trade (exports plus imports) over GDP. This relation is explained by the necessity of the role of the government in reducing external risks. As a result, government expenditures may thus be expected to increase with the degree of openness. Moreover, given that capital expenditure also tends to be a huge sum usually to invest in big projects, they will become feasible only if the country gets access in international capital market. Thus, openness is the next rational choice for conditions variable of government capital expenditure.

It is worth noting that although both the value added in the manufacturing sector and the degree of openness are expected to have positive relationships with the government capital expenditure to GDP, their theoretical underpinnings are different. The value added in the manufacturing sector influences the allocation of the capital expenditure through the demand side. As manufacturing sector becomes larger, it will demand more public services and infrastructure and hence put pressure on government to set more capital expenditure to facilitate this sector. The influence of the degree of openness to the allocation of capital expenditure, on the other hand, are indirectly through the supply side and when the government is granted the privilege of

access to international capital markets. In short the impact from demand side is direct and explicit but the impact through supply side is indirect.

The third conditions variable is urbanization (URB), which in this study represented by the population density following Musgrave's 1989 stipulation that an increase in congestion tends to raise demand for infrastructure made available by public investment.

However, the direction of relationship between the two variables may not be certain in practice. While the higher population density needs more public service, the rise in population density also increases the economy to scale as well as economic agglomeration economizing on the needs to expand public investments (a detailed study of the influence of agglomeration economy see Songtum Pinto 1994). An obvious example of this case is people living separately in rural areas vis-a-vis living together in the urban areas. In the latter case, the cost per unit of public services in the urban areas should be lower than the rural area's. Given strong and explicit effects of the agglomeration economy thus, the relationship between urbanization (represented by the population density) and the government capital expenditure to GDP can be negative particularly when considering the government expenditure in percentage of GDP. Although the negative relationship between these two variables is not widely discussed in the literature, any empirical evidence on this based on the case of Thailand would thus be a contribution of knowledge and/or debate to this area.

After considering the appropriate conditions variables, equation (13) can be written as:

$$\frac{GCAP}{GDP} = gcap\ \left[\left(\frac{TE\text{-}INT}{GDP}\right), \frac{GCAP_{T-1}}{GDP_{T-1}}, MANUV, OPEN, URB\right]$$

Assuming a linearized relationship, equation (13) can be written in the ready to estimate form as :

$$\frac{GCAP}{GDP} = \beta_0 + \alpha_1 \left(\frac{TE\text{-}INT}{GDP}\right) + \alpha_2\, OPEN + \alpha_3\, Urb + \alpha_4\, MANUV + \alpha_5 \frac{GCAP_{t-1}}{GDP} \quad (22)$$

The α_1, α_2 α_4 and α_5 all are expected to be positive.

This equation is empirically estimated in the next chapter to investigate whether these postulated independent variables exert influences on the capital expenditure and if as how strong their relative effects will be in line with the

hypotheses set out at the beginning.

3.3.2 Defining the conditions variable in the current expenditure equation

Relating to the dependent variable in equation (14) of the government current expenditure to GDP, two potential conditions variables are considered in addition to total expenditure after interest payment and the incrementalist variables. First is the dependency ratio (DEPR). Dependency ratio affects the current expenditure in at least two ways, the either through education expenditure, health expenditure or both. Relative to the total government expenditure in Thailand, education and health expenditure accounted for approximately 30 percent. This significant proportion justifies the inclusion of the dependency ratio as a conditions variable in this equation.

The second candidate is the value added of the manufacturing sector (MANUV). This variable influences the current expenditure in a less explicit way. Exerting its influence through the demand for capital expenditure, a rise the MANUV could negatively affect the allocation budget of current expenditure. The empirical evidence is expected to be even more pronounced when all expenditures are measured as percentage of GDP. As the economy develops (GDP going up), the manufacturing sector is expected to take a lead and grow faster. Given this circumstance, the government will also tend to set aside larger proportion of its budget to facilitate the manufacturing sector, resulting in lesser resources available for current expenditure (again as a percentage of GDP). In net term, however, the sign of the coefficient between MANUV and GCUR/GDP can be expected to be either negative or positive depending on the influences of MANUV on the capital expenditure relative to the responsiveness of the overall budget adjustment to this development. This empirical evidence will be discussed in details in subsequent chapter.

From the analysis above, the structure of equation (14) augmented by the two conditions variables can be written as:

$$\frac{GCUR}{GDP} = gcur\ [(TE\text{-}INT)/GDP,\ \frac{GCUR_{T-1}}{GDP_{T-1}},\ MANUV,\ DEPR]$$

Again in a linearized form, equation (14) can be readily estimated as:

$$\frac{GCUR}{GDP} = \beta_2 + \alpha_6 \frac{(TE\text{-}INT)}{GDP} + \alpha_7 DEPR + \alpha_8 MANUV + \alpha_9 \frac{GCUR_{t-1}}{GDPt\text{-}1} \qquad (23)$$

The α_6, α_7 and α_9 all are expected to be positive.

This equation is adopted for empirical estimate to investigate the behavior of the Thai governments in allocating their resources to current expenditure over the past three decades.

3.3.3 Defining the conditions variables in the other equations

The remaining seven equations will also be assigned a set of conditions variables deemed appropriate to explain the behavior of the government in allocating resources to such kind of activities. The choice of the conditions variables depends on the nature of each category of expenditure, in particular with respect to the functions and purpose of each.

3.3.3.1 Defining the condition variables in the economic affairs expenditure equation

As for the economic affairs expenditure equation the value added of the manufacturing sector (MANUV) is again believed to play a critical role given the significance of this sector in the Thai economy. Since the national economic structure has normally been dominated by the manufacturing sector, the growth of this sector usually has a resounding effect on the economic related expenditure. Besides, the degree of openness is also important in determining the level of economic affairs expenditures. Since the degree of openness reflects how much the country is exposed to the external influences (import plus export), the needs for government's intervention are also likely to increase proportionally—reflected by the economic affairs expenditure. In Thailand, the degree of openness has become larger over the years and economic development relies critically on the export sector as an engine for growth. As a result, the expenditure for economic affairs is expected to be positively related to the degree of openness.

The structure equation of equation (15) after the inclusion of the two conditions variables—the value added of manufacturing sector (MANUV0 and the degree of openness (OPEN) can be written as:

$$\frac{\text{E-AFFAIR}}{\text{GDP}} = \text{gcap}\left[\frac{(\text{TE-INT})}{\text{GDP}}, \frac{\text{E-AFFAIR}_{T-1}}{\text{GDP}_{T-1}}, \text{MANUV}, \text{OPEN}\right]$$

In linear form, equation (15) that is ready for empirical tests can be written as:-

$$\frac{\text{E-AFFAIR}}{\text{GDP}} = \beta_3 + \alpha_{10}\frac{\text{(TE-INT)}}{\text{GDP}} + \alpha_{11}\,\text{OPEN} + \alpha_{12}\,\text{MANUV} + \alpha_{13}\frac{\text{E-AFFAIR}_{t-1}}{\text{GDPt-1}} \quad (24)$$

The $\alpha_{10}, \alpha_{11}\, \alpha_{12}$ and α_{13} all are expected to be positive.

3.3.3.2 Defining the condition variables in the education expenditure equation

On the education expenditure equation the ratio of the population under 15 years old are added to the education equation to account for the fact that the compulsory education that the government provides for free of charge is in the primary schools. During the period of study, the governments provide free education from the primary level 1 to level 6. Thai children normally start their first year of primary schools at 7 years old and, after six years in the primary schools they graduate at around 13 years old. Children in primary schools are therefore normally under 15 years of age. The inclusion of this variable should correspondingly capture the effects of the young on the allocation of resources to education expenditure.

The structure of equation (16) after inclusion of the conditions variables—the ratio of people under 15 years old (AGE15) can be written as:

$$\frac{\text{EDUCA}}{\text{GDP}} = \text{gduca}[(\text{TE-INT})/\text{GDP}, \frac{\text{EDUCA}_{\text{T-1}}}{\text{GDP}_{\text{T-1}}}, \text{AGE15}]$$

Assuming a linear form, equation (16) may be written in a ready to empirically estimate form as:

$$\frac{\text{EDUCA}}{\text{GDP}} = \beta_4 + \alpha_{14}\frac{\text{(TE-INT)}}{\text{GDP}} + \alpha_{15}\,\text{AGE15} + \alpha_{16}\frac{\text{E-AFFAIR}_{t-1}}{\text{GDP}_{t-1}} \quad (25)$$

The α_{14}, α_{15} and α_{16} all are expected to be positive.

3.3.3.3 Defining the conditions variables in the health expenditure equation

As for the health expenditure, the proportion of people over 60 years old will be included. Given that the people over 60 years of ages tend to be the prime users of health care services, the larger proportion of the elder should also affect the proportion of government expenditure set for health care purposes.

The nature of equation (17) after inclusion of the conditions variables—the ratio of people over 60 years old (AGE60) can be written as:

$$\frac{\text{HEALTH}}{\text{GDP}} = \text{health}\left[\frac{\text{(TE-INT)}}{\text{GDP}}, \frac{\text{HEALTH}_{\text{T-1}}}{\text{GDP}_{\text{T-1}}}, \text{AGE60}\right]$$

In linear and readily estimable form, equation (17) becomes:-

$$\frac{\text{HEALTH}}{\text{GDP}} = \beta_5 + \alpha_{15}\frac{\text{(TE-INT)}}{\text{GDP}} + \alpha_{16}\,\text{AGE60} + \alpha_{17}\frac{\text{HEALTH}_{t-1}}{\text{GDP}_{t-1}} \quad (26)$$

The $\alpha_{18,}$ α_{19} and α_{20} all are expected to be positive.

3.3.3.4 Defining the conditions variables for the social and welfare expenditure equation

As for the social and welfare expenditure, the dependency ratio is incorporated. This dependency ratio is the sum of the shares of people less than 15 years old and more than 60 years, representing the groups that tend to need more extensive assistance. Since social and welfare expenditures are targeted to help the under privileged groups, the dependency ratio covering the group of people largely dependent on others, should thus be a logical conditions variable for the social and welfare expenditure.

The empirical equation of equation (18) after inclusion of the conditions variables—the dependency ratio (DEPR) can be written as:

$$\frac{\text{SOCIAL_WELF}}{\text{GDP}} = \text{social_welf}\left[\frac{\text{(TE-INT)}}{\text{GDP}}, \frac{\text{SOCIAL_WELF}_{T-1}}{\text{GDP}_{T-1}}, \text{DEPR}\right]$$

Using a linear form, equation (18) in the ready to empirically estimate form is:

$$\frac{\text{SOCIAL_WELF}}{\text{GDP}} = \beta_6 + \alpha_{21}\frac{\text{(TE-INT)}}{\text{GDP}} + \alpha_{22}\,\text{DEPR} + \alpha_{23}\frac{\text{SOCIAL_WELF}_{t-1}}{\text{GDP}_{t-1}} \quad (27)$$

The $\alpha_{21,}$ α_{22} and α_{23} all are expected to be positive.

3.3.3.5 Defining the conditions variables for the purchasing of goods and services expenditure equation

This proportion of expenditure allocated for acquiring goods and services from private sector, usually relates to procurements of miscellaneous items for day to day operations. Thus, no explicit conditions variables are deemed appropriate for this equation.

The empirical form of equation (19) can be written as:

$$\frac{\text{GOODS_SERV}}{\text{GDP}} = \text{goods}\left[\text{(TE-INT)/GDP}, \frac{\text{GOODS_SERV}_{T-1}}{\text{GDP}_{T-1}}\right]$$

To simplify the linear form of equation (19) in the ready to empirically estimate form is shown in equation (28).

$$\frac{\text{GOODS_SERV}}{\text{GDP}} = \beta_7 + \alpha_{24}\frac{\text{(TE-INT)}}{\text{GDP}} + \alpha_{25}\frac{\text{GOODS_SERV}_{t-1}}{\text{GDP}_{t-1}} \qquad (28)$$

The α_{24} and α_{25} are expected to be positive.

3.3.3.6 Defining the conditions variables for the wage and salary expenditure equation

The expenditure on wages and salaries depends on two important factors, the number of civil servants and the average wages level. In general, the number of civil servants tends to grow in line with the economic and social complexity. As the country's structure becomes more sophisticated, the more role of government is required in laying down legal and social infrastructures to protect peace, harmony, and efficient functioning of society. It should also be noted that the roles of government could grow without the amplification of civil servants e.g. through the public structural reform and efficiency-enhancing programs.

The pay scales of the civil servants are expected to adjust in line with the economic growth and the pay scales in the private sector. Although it is true that the adjustment in the pay scales of the public sector tends to be slower than that of the private sector, the public sector had always taken private payment scales and economic growth into considerations. To capture the effects of these factors, two proxy conditions variables will be added: first the value added in the manufacturing sector, and second per capita income of the people in the country. In addition, to cover the effects of wage payments according to the enlarging role of the government, the dependency ratio will also be added to this equation.

The empirical composite of equation (20) including the three conditions variables can be written as:

$$\frac{\text{WAGE}}{\text{GDP}} = \text{goods}\ [(\frac{\text{TE-INT}}{\text{GDP}}), \frac{\text{WAGE}_{T-1}}{\text{GDP}_{T-1}}, \text{MANUV}, \text{DEPR}\ ]$$

If the linear form is assumed, equation (20) in the ready to empirically estimate form is:

$$\frac{\text{WAGE}}{\text{GDP}} = \beta_8 + \alpha_{26}\frac{\text{(TE-INT)}}{\text{GDP}} + \alpha_{27}\frac{\text{WAGE}_{t-1}}{\text{GDP}_{t-1}} + \alpha_{28}\,\text{MANUV} + \alpha_{29}\,\text{DEPR} \qquad (29)$$

The α_{26} , $\alpha 27$, $\alpha_{28,}$ and α_{29} are expected to be positive.

3.3.3.7 Defining the conditions variables for the total expenditure equation

This equation is the aggregate government expenditure equation. Here, two aggregate conditions variables are added. First is the per capita income. This conditions variable will represent the level of the country's development. The second is a dummy variable to capture the effect of the economic crisis from 1985 to 1989. At that time, Thailand was faced with economic difficulties, which engendered a number of economic policy responses to the crisis. The adjustments included in particular fiscal adjustments. Therefore, the dummy variable will be assigned to zero during that difficult periods and to unity otherwise. If the economic difficulties had repercussions on total budget allocation, a statistically significant coefficient can be expected of the dummy variable.

The empirical form of equation (21) after the inclusion of the three conditions variables can be written as:

$$\frac{TE}{GDP} = te\left[\left(\frac{TE\text{-}INT}{GDP}\right), \frac{TE_{T-1}}{GDP_{T-1}}, GDPP, DUM\right]$$

Assuming a linear form, equation (21) in the ready to empirically estimate form may be written as:

$$\frac{TE}{GDP} = \beta_9 + \alpha_{30}\frac{(TE\text{-}INT)}{GDP} + \alpha_{31}\,GDPP + \alpha_{33}DUM + \alpha_{34}\frac{TE_{t-1}}{GDP_{t-1}} \qquad (30)$$

The α_{30}, α_{31}, α_{32} and α_{34} all are expected to be positive.

Up to this stage, nine empirical equations have been developed, shown as equations (22) to (30). All of them are in the forms ready to be estimated.

3.4 Estimation Procedures

Every equation will be estimated independently using an Ordinary Least Square (OLS) method. To ensure a best, linear, unbiased estimate (BLUE), proper steps will be taken. Since the study is a time series analysis, the nature of data can be expected to raise the problem of auto correlation or serial correlation. As a result, every equation will be tested for autocorrelation by using Q statistic as proposed by Box and Pierce (Box and Pierce, 1970) (see discussions below).

3.5 The Coverage and Sources of Data

The time series data, which has been used in the regression analysis, cover the period form 1972 to 1999. Although many data series were dated back to the 1960 such as GDP, the population data, the manufacturing and agricultural sectors' values added, some limitations were encountered in the attempt to estimate equations back to the year 1960. First, the government expenditure data used here is based on the Government Finance Statistics basis (GFS) which started from only1972. Since the International Monetary Fund (IMF) has published this Government Finance Statistics complied and submitted by The Bank of Thailand (the government is in the process of transferring this task to the Ministry of Finance soon) annually, this data have the desirable features of continuity and consistency published. Using the GFS concept also has some advantage. First, it is a standard for all country in the world to follow using the same compilation procedure. Therefore, the data are internationally comparable. Second, the GFS data is presented in the form of consolidated central government, which includes both intra-budgetary expenditure as, appeared in the annual budget acts, and the extra-budgetary expenditure that does not appear in the annual budget. The main item of expenditure that is not shown in the annual budget is the foreign financed expenditure. This item, however, accounts to not more than ten percent of the total budget as determined by the law. Lastly, the GFS classification presents both economic classifications -- current and capital expenditure-- and functional classifications-- economic affairs, education, health and so on. This helps to segregate the effects of the independent variables on these micro allocative behaviors of expenditure policy. The nine equations proposed above and to be empirically tested in this study are thus based on the GFS classification.

3.6 Methodology on Techniques of Statistical Method

3.6.1 Tackling the problems of serial or autocorrelation

It is anticipated that using time series data will be a cause of serial correlation whereby the residuals are related to their own lagged values. If this is the case, one of the conditions for best, linear, unbiased estimated (BLUE) of regression equation will not hold causing parameter estimates to be biased and misinterpreted. Concerns that

this study is based on time series data warrant special attention to be paid to the problem of serial correlation. This can be achieved through appropriate transformations of the original equations to ensure that the estimated equation will be safe from serial correlation so that the statistical and economic inferences may be drawn correctly.

In general, the standard way to detect a serial correlation is the Durbin-Watson statistics (DW). The DW is a standard parameter with predictable distribution pattern around a level 2 normally presented in the regression output with other parameters such as T-Statistic, R square, and so on. The intuitive way interpret the DW statistic is if it is approximately 2, it may be safely concluded that there is no serial correlation in the equation.

It is crucial to note that the Durbin Watson test has some limitations. It is only a partial test for the first order serial correlation and requires that the regression equation has no lag dependent variable among the regressors. In this study due to test for the Incrementalist Variables, lagged dependent variables have to be incorporated as a regressor, the Durbin Watson test is not applicable.

A more general and more reliable approach in tackling with the serial correlation than the Durbin Watson test is the Ljung-Box Q statistic test, hence forth referred to as Q Statistic. It computes the autocorrelation and partial correlation of the residuals up to any specified number of lags. The Q statistic is given by :

$$Q_{LB} = T(T+2) \sum_{J=1}^{P} \frac{r_j^2}{T-j}$$

Where r_j is the j-th autocorrelation and T is the number of observations. Q statistic can be used to test the hypothesis whether all of the autocorrelations are zero; and if accepted the analyzed series can be confirmed a white noise. Under the null hypothesis, Q is distributed as chi square, with degree of freedom equal to the number of autocorrelations, p, if the series has not previously been subject to an ARIMA analysis. If the series is a residual from an ARIMA estimation, however, the degree of freedom will be the number of autocorrelations less the number of autoregressive and moving average terms previously estimated (Box and Pierce, 1970).

All estimated equations in this study will employ Q statistic to test for the autocorrealations and the final estimated equations presented in this study will already be corrected for any autocorrelation present. The details of the Q statistic testing results for all equations are shown in Appendix 1.

Table 3.1 Empirical Equations and Expected Signs

Equation	Dependent Variable	Independent Variable and Expected Sign				
No. 22	GCAP/GDP	(TE-INT)/GDP	OPEN	URB	MANUV	$GCAP_{T-1}/GDP_{T-1}$
		+	+	+	+	+
No. 23	GCUR/GDP	(TE-INT)/GDP	DEPR	MANUV	$GCUR_{T-1}/GDP_{T-1}$	
		+	+	+	+	
No. 24	E-AFFAIR/GDP	(TE-INT)/GDP	OPEN	MANUV	$E\text{-}AFFAIR_{T-1}/GDP_{T-1}$	
		+	+	+	+	
No. 25	EDUCA/GDP	(TE-INT)/GDP	AGE15	$EDUCA_{T-1}/GDP_{T-1}$		
		+	+	+		
No. 26	HEALTH/GDP	(TE-INT)/GDP	AGE60	$HEALTH_{T-1}/GDP_{T-1}$		
		+	+	+		
No. 27	SOCIAL_WELF/GDP	(TE-INT)/GDP	DEPR	$SOCIAL_WELF_{T-1}/GDP_{T-1}$		
		+	+	+		
No. 28	GOODS_SERV/GDP	(TE-INT)/GDP	$GOODS_SERV_{T-1}/GDP_{T-1}$			
		+	+			
No. 29	WAGE/GDP	(TE-INT)/GDP	DEPR	MANUV	$WAGE_{T-1}/GDP_{T-1}$	
		+	+	+	+	
No. 30	TE/GDP	(TE-INT)/GDP	GDPP	YE_{T-1}/GDP_{T-1}	DUM	
		+	+	+	+	

Table 3.2 Definition and Source of Data

Variable	Definition	Source of Data
1. Dependency Ratio (DEPR) 1957:1999	The share of population younger than 15 years and older than 60 years relative to the working –age population (15 to 60 years old)	National Statistic Office, The Ministry of Interior
2. Value Added in the Manufacturing Sector (MANUV) 1951:1999	Value Added of the Manufacturing Sector in nominal term as defined in the national account (SNA)	National Economic and Social Development Board (NESDB)
3. Government Capital Expenditure (GCAP) 1972:1999	Government Capital Expenditure in nominal terms as classified by the GFS basis. This will include both the expenditure intra and extra budget of the central government	The primary source of data is the Fiscal and Production Statistic Team and the Public Finance Team, Bank of Thailand The IMF has also published as a secondary source in the GFS yearbook.
4. Government Current Expenditure (GCUR) 1972:1999	Government Current Expenditure in nominal terms as classified by the GFS basis. This will include both the expenditure intra and extra budget of the central government	
5. Economic Affair (E-AFFAIR) 1972:1999	Government Economic Affairs Expenditure in nominal term as classified by the GFS basis. This will include both the expenditure intra and extra budget of the central government	
6. Education (EDUCA) 1972:1999	Government Education Expenditure in nominal term as classified by the GFS basis. This will include both the expenditure inside and outside budget of the central government	

Table 3.2 (Continued)

Variable	Definition	Source of Data
7. Health 1972:1999	Government Health Expenditure in nominal term as classified by the GFS basis. This will include both the expenditure inside and outside budget of the central government	The primary source of data is the Fiscal and Production Statistic Team and the Public Finance Team, Bank of Thailand The IMF has also published as a secondary source in the GFS yearbook.
8. Social Welfare (SOCIAL_WELF) 1972:1999	Government Social Welfare Expenditure in nominal term as classified by the GFS basis. This will include both the expenditure inside and outside budget of the central government	
9. Wage 1972:1999	Government Wage and Salary Expenditure in nominal term as classified by the GFS basis. This will include both the expenditure inside and outside budget of the central government	
10. Goods & Services (GOODS_SERV) 1972:1999	Government Goods & Services Expenditure in nominal term as classified by the GFS basis. This will include both the expenditure inside and outside budget of the central government	
11. Total Expenditure (TE) 1972:1999	Capital Expenditure + Current Expenditure	
12. Interest Payment (INT) 1972:1999	Government Interest Payment Expenditure in nominal term as classified by the GFS basis. This will include both the expenditure inside and outside budget of the central government	

Table 3.2 (Continued)

Variable	Definition	Source of Data
13. Degree of Openness (OPEN) 1957:1999	Total foreign trade (exports + imports) over GDP	NESDB and Bank of Thailand
14. Current Account (CA) 1957:2000	Trade account + Service account as defined in the balance of payments basis	The primary sources of data are the Customs department Ministry of Finance and the Tourism Authority of Thailand. The Bank of Thailand uses these sources of data to compile components of the balance of payments account. The Bank of Thailand's refined data are also used in the process of constructing the national account (SNA) by the NESDB
15. Urbanization (URB) 1951:1999	Population density	National Statistic Office, The Ministry of Interior
16. Age15 1960:1999	Population younger than 15 years / population	
17. Age 60 1957:1999	Population older than 60 years / population	
18. GDP 1951:1999	Gross domestic product in nominal term as appeared in the SNA	NESDB
19. GDPP 1951:1999	Gross domestic product in nominal term per capita as appeared in the SNA	NESDB
20. Dummy (DUM)	Taking zero value the policy changes and crisis during the period of study, 1 otherwise	

CHAPTER 4

EMPIRICAL RESULTS

In this chapter the empirical results are presented for all nine equations. These empirical results are accompanied by the interpretation, as well as the discussions of the probable underlying reasons of the estimated results especially when the results are not consistent with expectations.

4.1 The Empirical Estimation Result of the Capital Expenditure Equation

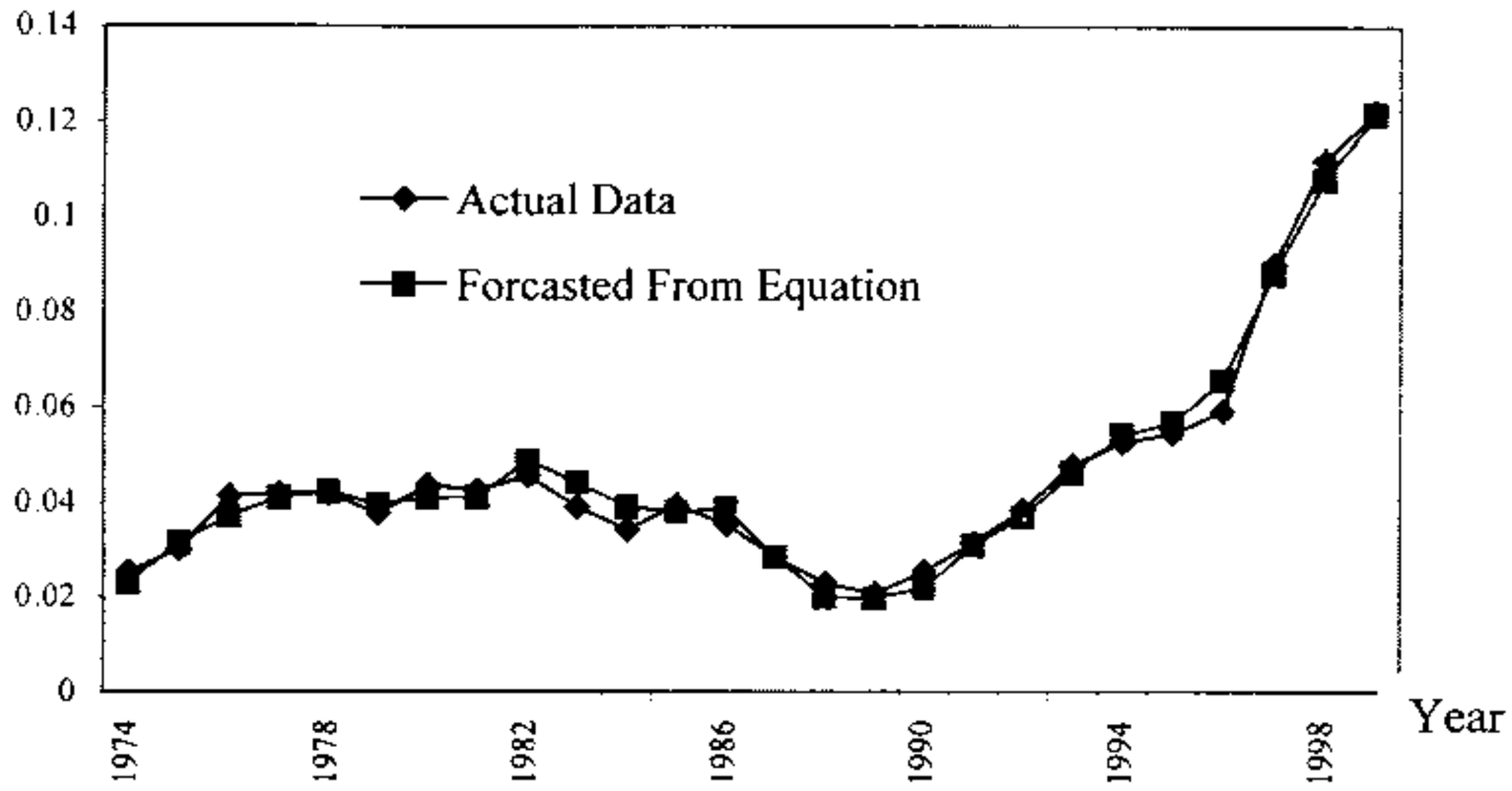
From equation (22), presented in the Methodology Chapter the final forms estimated and chosen as best fitted is shown below. For referring purpose, a letter E will be put after the corresponding designation of all estimated equations. For example equation (22), after being estimated, equation (22E). The number in the parentheses express the t- statistics, and the symbol * means it is statistically significant at 95 percent level of confidence.

$$\underset{}{\text{GCAP/GDP}} = \underset{(2.0)}{0.504} + \underset{(3.9)}{0.316}\,\text{(TE-INT)/GDP*} - \underset{(-2.6)}{0.0004}\,\text{OPEN} - \underset{(-2.6)}{0.0006}\,\text{Urb*} +$$

$$\underset{(6.3)}{0.045}\,\text{MANUV*} + \underset{(2.6)}{0.267}\,\text{(GCAP(-1)/GDP(-1)*} + \underset{(2.3)}{0.483}\,\text{AR1} \quad \text{(22E)}$$

$$R2 = 0.98\,, \quad \text{Adjusted } R2 = 0.98 \quad \text{F-Statistic} = 239.1^{*}$$

Equation (22E) is accepted as reasonable in explaining government capital expenditure based on its statical significance shown by the F-statistic being significant at more than 95 percent. Moreover, the R^2 value also indicates that the movements of capital government expenditure can be explained by this set of independent variables up to 95 percent. The remaining 5 percent which cannot be explained by this equation, is technically called the residual terms and judged to be which statistically acceptable range.



Graph 4.1 The Goodness of Fit of the Government Capital Expenditure Equation

In graph 4.1, the path of actual government capital expenditure is plotted along with forecast government capital expenditure deriving from equation (22E).

All of the independent variables are statistically significant. As expected, the total expenditure after interest payment ((TE-INT)/GDP) is positively related to the capital expenditure. Similarly, the value added for manufacturing sector (MANUV) and the incrementalist variable (GCAP (-1)/GDPN (-1)) also play a positive role in determining government's capital expenditures. Contradiction to expectation, however, the degrees of openness (OPEN) and urbanization (URB) appear to influence the capital expenditure negatively, which warrants further discussions in some more details.

4.1.1 The impacts of the degree of resource available variable ((TE-INT)/GDP)

This variable reflects the amount of resources that are available to allocate for all types of government expenditure. From the equation, it may be inferred that in deciding the annual capital expenditure allocation, the government usually looks at the total resources available to it under the budget after paying for the prior commitments such as interest payment. A priori committed expenditure in this study is confined to only interest payment excluding principal repayment in accordance

with thc GFS basis data. According to the GFS basis, the principle repayment is not categories as a part of the expenditure. Therefore, the interactions between various items of government expenditure will not apply to the principal repayment. Based on this accounting framework, thus, only the total expenditure net of the pre-committed interest payment will be relevant as a determinant of government capital expenditure.

4.1.2 The impacts of the degree of openness

As for the degree of openness in the literature, Rodrik (1996) and Hewitt (1991) suggest that the degree of openness as measured by the total foreign trade (import plus export) should be positively related to the government expenditure since there will be more demands for government's roles in reducing external risks. According to this postulation, the degree of openness tends to increase as the country is more exposed to the external sector. Under this circumstance, the government as a sovereign debtor with the minimal risk will be called upon to increase its role to absorb the increased external risks. This argument has to be investigated carefully in the case of Thailand where the government has traditionally played a rather limited role in the economy, accounting for less than 20 percent of the GDP. In addition, the government has stated consistently both in the medium term national plans and the day-to-day operational declarations to the parliament that it would pursue policy to enhance private participation. As a result, the government's role in the economy has been quite limited in the case of Thailand. In this regard, the argument as proposed by Rodrik and Hewilt may not hold. In addition, experiences from the recent financial crisis also indicate that private sector has been proactive and increased of exposures to external risks while the government has been conservative in minimizing its role in the economy, which can be observed from the consecutive fiscal surplus during 1987 to 1999. Therefore when the degree of openness increases in line with the active private participation as well as the policy to enhance private sector, the government continues to restrict its role in the economy. This is reflected in the negative relationship between the size of the government (here defined as only capital expenditure and the degree of openness.

4.1.3 The impacts of the degree of urbanization

As for the urbanization, it is found to be negatively related to the government capital expenditure again contradictory to the proposition of Musgrave (1989).

In Musgrave 1989, a positive relationship between the urbanization and the capital expenditure is expected as an increase in congestion is likely to heighten demand for infrastructure and thus public services. However, the relationship of the two variables may be analyzed in a different light. In this study, population density is used to represent the degree of urbanization. While it is true that a higher population density needs more public service, the population density may also increase an economy to scale as well as an agglomeration of the economy. Economic agglomeration implies that people will benefit mutually from living together (for a detailed analysis of the influence of an agglomeration of the economy, see Songtum Pinto 1994). These benefits also include the benefits from joint utilization of the public services. The cost per unit of providing public services may therefore decline in line with increased population density. Moreover, an economy of scale may also contribute to a lower cost of capital expenditure given a specific level of public services provided. Statistically, it is also important to note that the denominator GDP also tends to increase with urbanization or population density. The increase in GDP, the economy of scale as well as the economic agglomeration all together probably contribute to the negative relationship with the government capital expenditure relative to GDP. In short, it may be argued that the cost per unit of public services in the urban areas should be lower than the rural area's. Empirically, in another study by Pranee Tinnakorn and Chalongphob Susangkarn (Pranee Tinnakorn and Chalongphob Susangkarn, 1996), no significant relationship at all was found between urbanization and government capital expenditure based on the international data of 45 countries including Thailand, and following the methodology of Heller and Diamond.

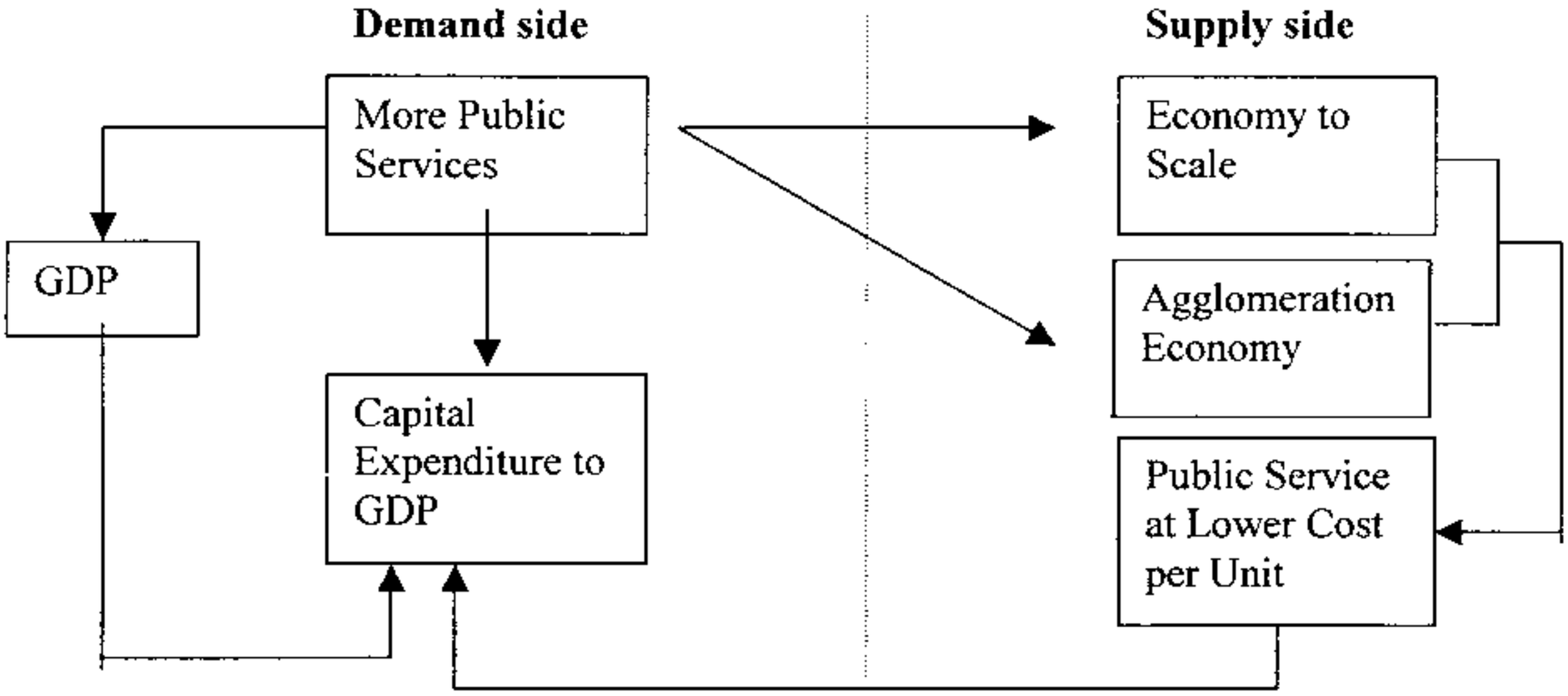
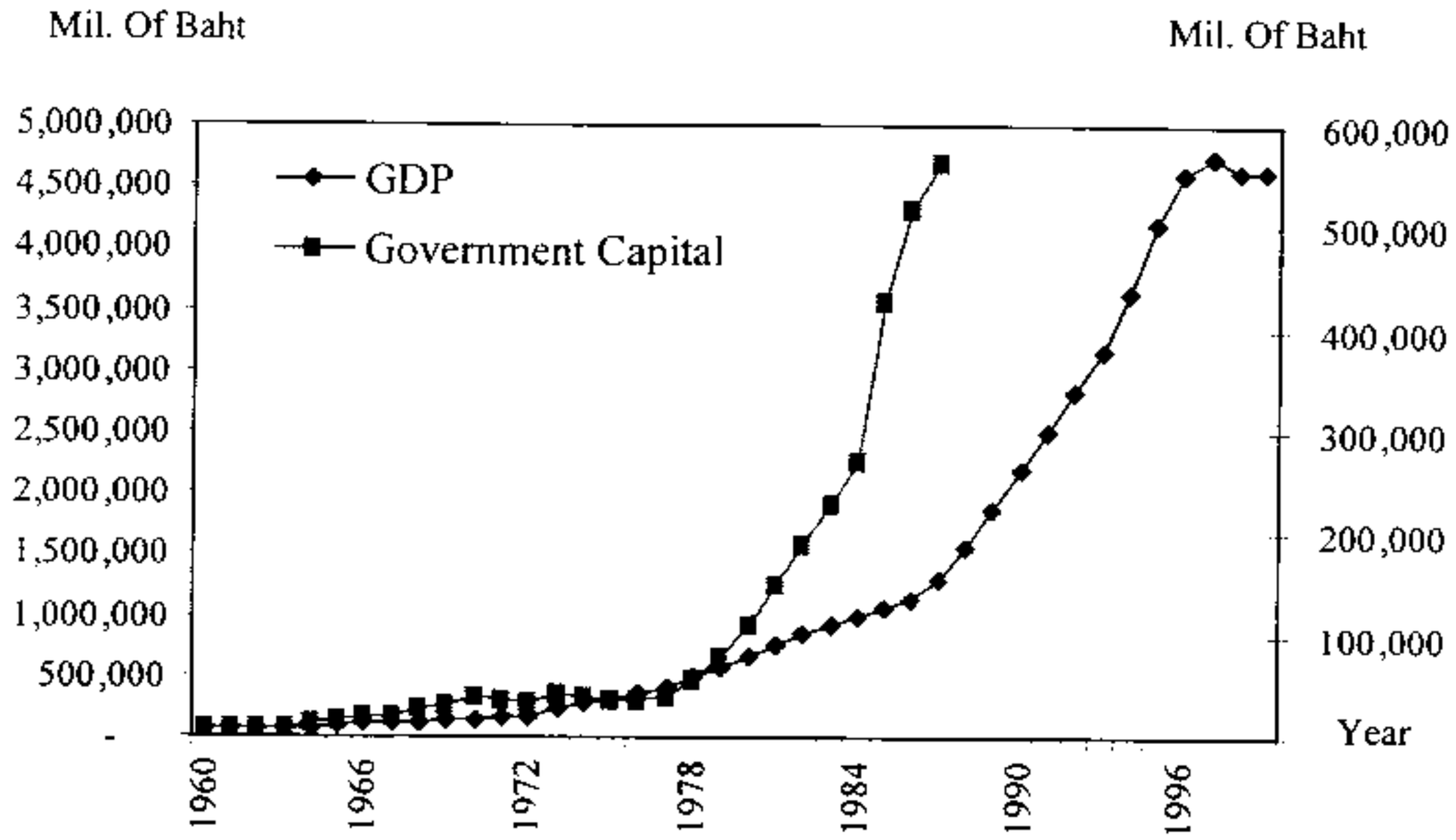


Diagram 4.1 The Two-Sides Impacts of Urbanization to the Capital Expenditure

In Diagram 4.1, it can be postulated that once urbanization intensifies it generates both demand and supply effects on government capital expenditure. On the demand side, urbanization is expected to naturally lead to an increase in demand for public service and hence the needs for government to allocate more resources to capital expenditure. Therefore, judging merely from the demand side it can be expected that increased capital expenditure will be linked to urbanization. On the supply side, however, these factors will work in the opposite direction to the demand side. The factors on the supply side deliver impacts on the economy via scale economies and the agglomeration economy. The net impacts will thus depend on the relative strength of supply and demand effect. In a rare case though not impossible such as Pranee Tinnakorn and Chalongphob Susangkarn 1996, the two effects may in theory cancel each other out leaving a statistically insignificant impact of urbanization (population density) on government capital expenditure.

To obtain a clearer sense of the impacts of each independent variable on the government capital expenditure relative to GDP, the latter's development is also investigated from a historical perspective along with each independent variable, bilaterally.

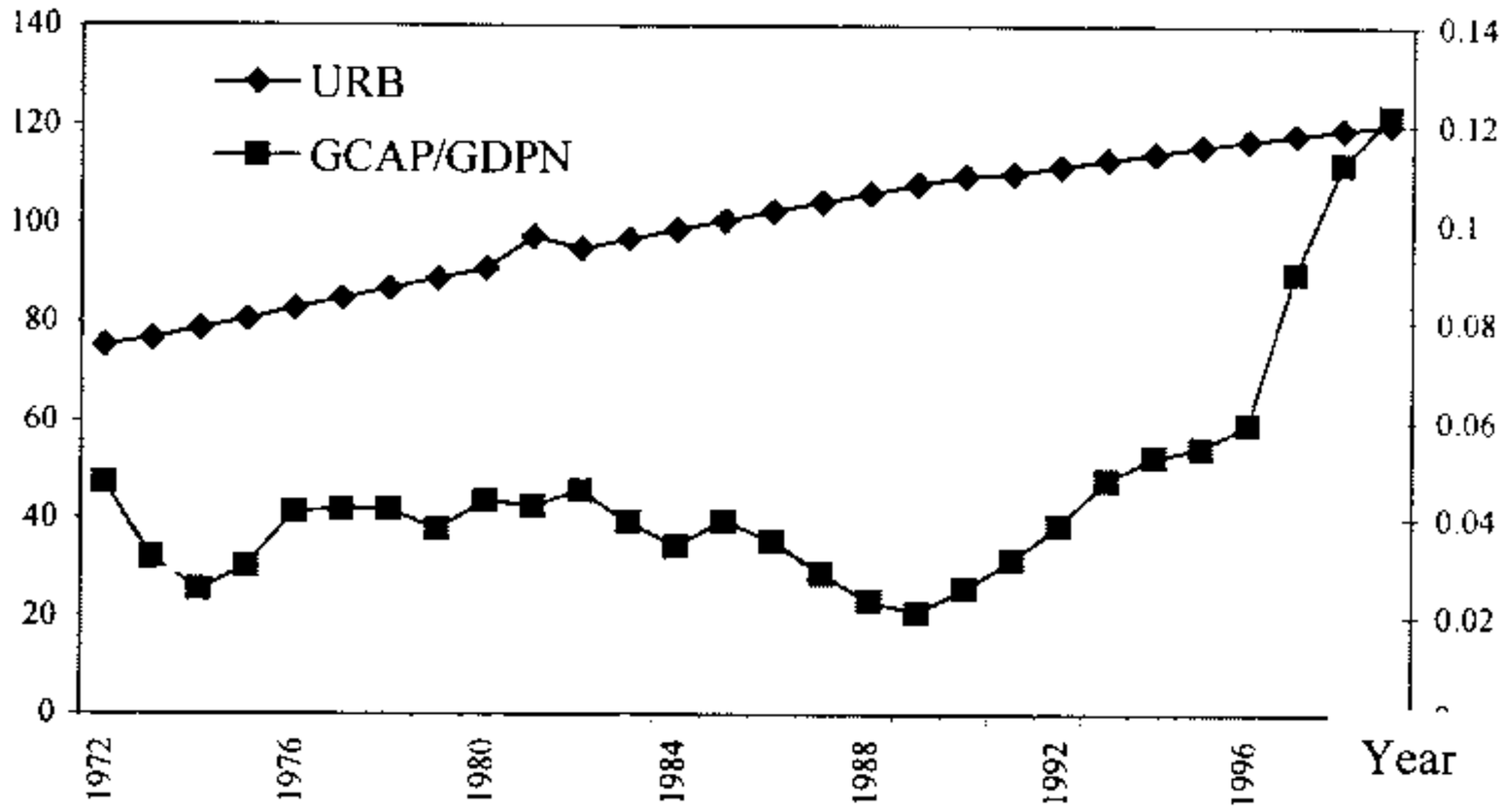


Graph 4.2 GDP and Government Expenditure

The expansion of GDP influences the ration of government capital expenditure to GDP both directly and indirectly. Most directly, an increase in GDP as the denominator will lower the ratio. Indirectly, however, GDP growth will expand the revenue base of the government, granting more room for the government to increase its capital expenditure. In net term, the impacts of the GDP can either increase or decrease the government capital expenditure/GDP ratio depending on relative impacts via the two channels of GDP on the government capital expenditure. Looking at the historical data during 1960-1999 shown in Graph 4.2, it may be seen that in the 1960s and early 1970s when the economy was stagnant or depressed, the government capital expenditure seemed to be constrained, leading the government capital expenditure/GDP ratio to decline. During the period of economic boom of 1987-1996, however, despite the government running consecutive budget surpluses, the government capital expenditure can still be perceived to have gone up faster than the GDP, raising the ratio substantially.

On urbanization, although the government capital expenditure to GDP ratio tended to fluctuate over the period, the degree of urbanization during that period increased steadily (see graph 4.3). This is probably the main reason why the estimated coefficient of the urbanization in equation (22E) turned out to be rather small of only 0.0006. Economically, this could be interpreted that the influence of the urbanization on the allocation of the government capital expenditure is minute, which

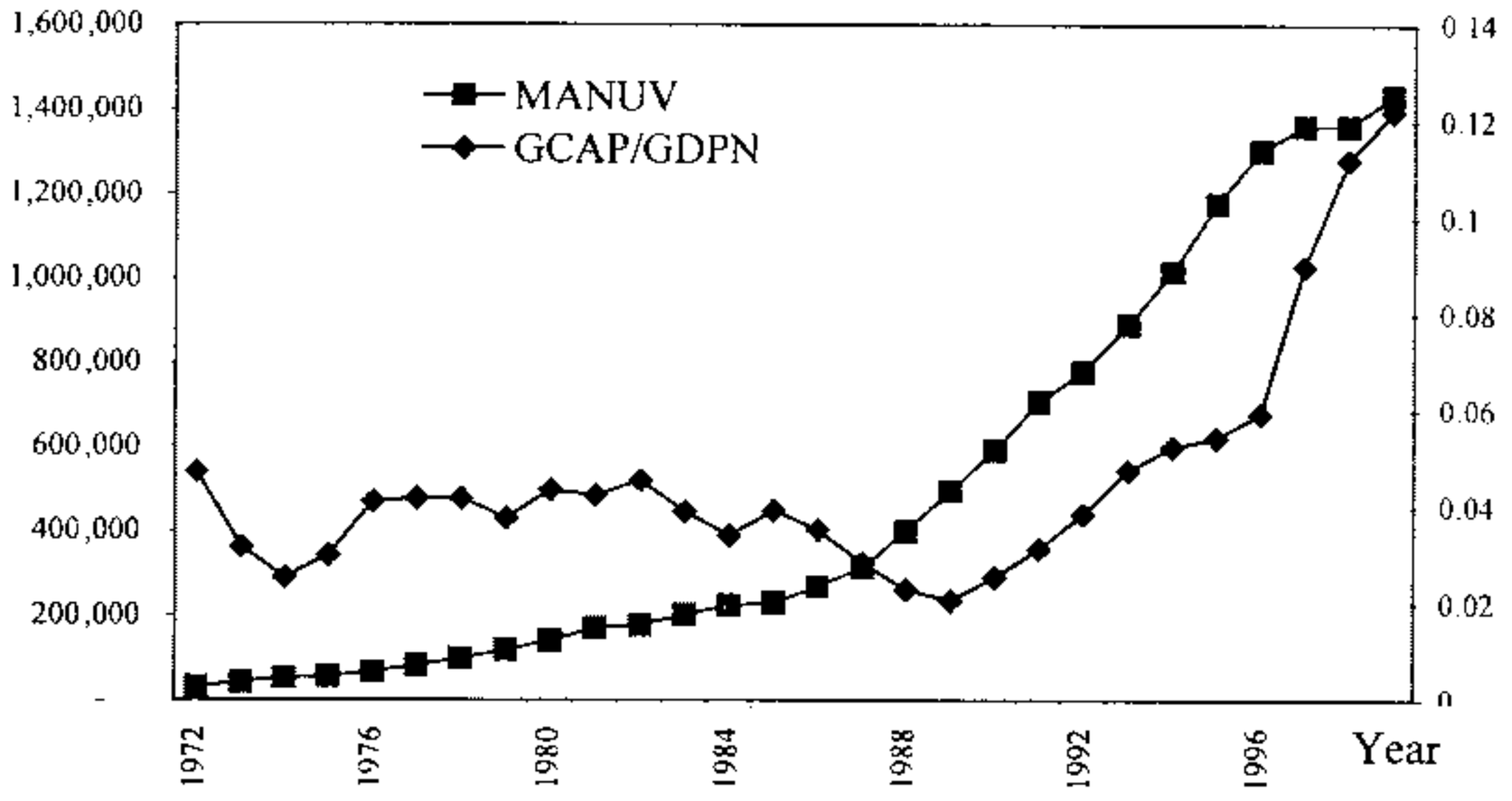
on the other side of the coin implies that the government rarely takes this factor into consideration when deciding on its capital expenditure allocation.



Graph 4.3 Urbanization and Government Expenditure to GDP Ratio

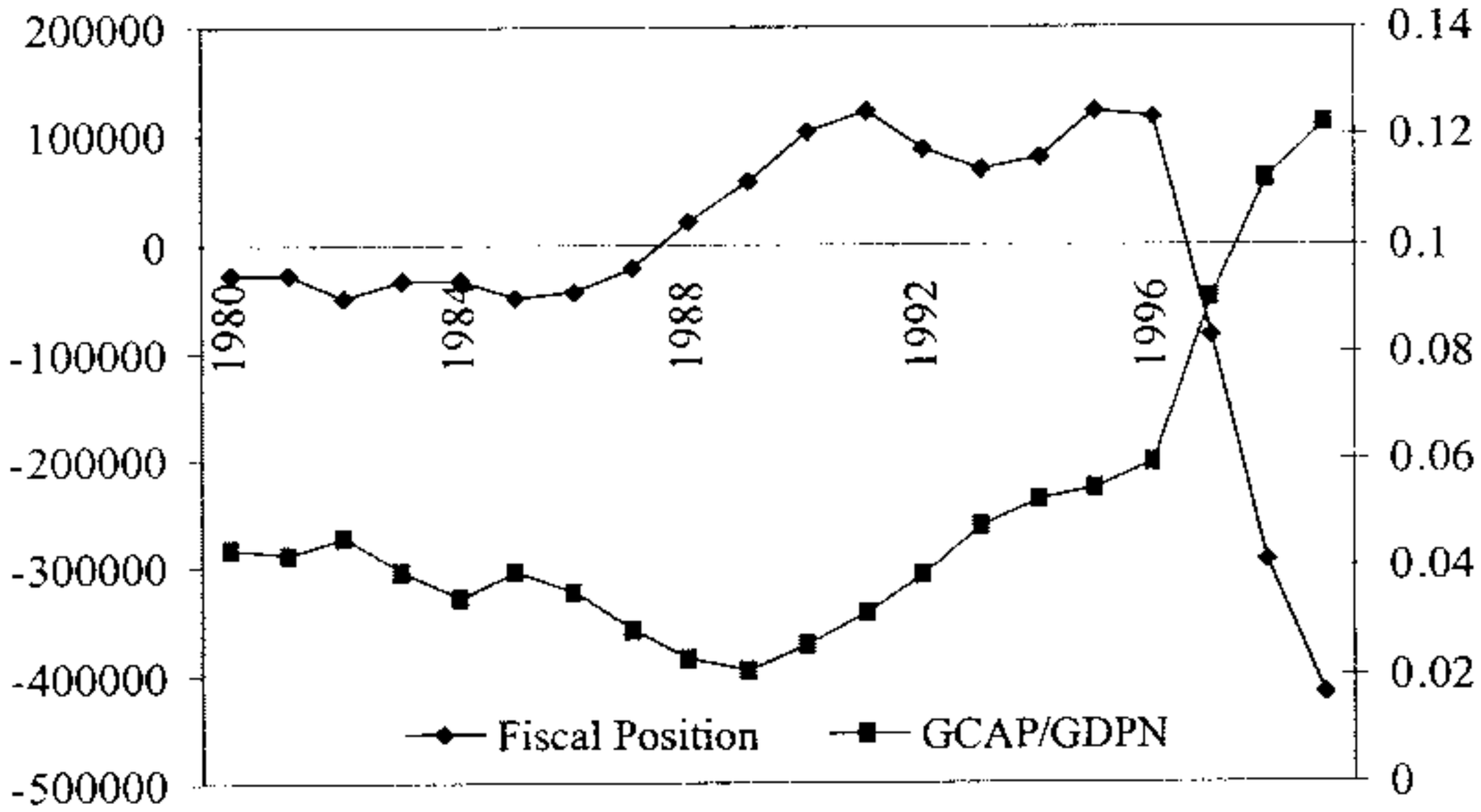
4.1.4 The impacts of the size of the manufacturing sector

The estimated coefficient of the value added in manufacturing sector, on the other hand, is statistically very significant at more than 95 percent confidence level. The estimated sign is also positive and in line with expectation. Therefore, the size of the manufacturing sector (MANUV) obviously has an impact on the government capital expenditure allocation. Despite its statistical significance, however, the magnitude of the coefficient of MANUV is not large. Historically, the impacts of the MANUV on the government capital expenditure relative to GDP only become more explicit following the economic boom from 1987 to 1996. Before the year 1987, when the economy was relatively stagnant and depressed due to the oil crises and prior to relocation of industrial production bases from Japan and the NIEs to Thailand in late 1980s, MANUV played rather limited role. After the economic crisis in the year 1997, the roles of MANUV become limited again as a large part of manufacturing sector underwent debt restructuring while government expenditure rose with the budget deficit to alleviate the social impacts of the crisis.



Graph 4.4 Value Added in the Manufacturing Sector and Government Expenditure Capital to GDP Ratio

Under crisis, the containment of the current expenditure (which was mostly the wages and salaries) was rather difficult. The easiest way to implement fiscal consolidation has traditionally been to contain the government capital expenditure usually with time lags due to continuity of investment projects. Therefore, despite observation of moderate expansion in the manufacturing sector (graph 4.4), the government capital expenditure still continued to rise. As the economy contracted and the manufacturing sector moderated further, government first ran up its deficit while continuing to finish off existing projects reflected in continued increase in government capital expenditure allocation (see graph 4.5). As deficit grew, however, the fiscal position (revenue and grants-expenditure and net lending) began to weighed down government capital expenditure. It may thus be observed that during the period of 1987-1996 where the fiscal position is favorable, the government capital expenditure to GDP ratio moves in close correlation with the fiscal position. The relationship, however, reversed during crisis and began to converts again after words.



Graph 4.5 Fiscal Position (Revenue-Expenditure) and Government Capital Expenditure to GDP Ratio

4.1.5 The impacts of the increnmentalist variable (GCAP(-1)/GDP (-1))

This variable represents the idea of the incrementalist school, which believes in the bounded rationality and limited proactiveness of the government officials. The estimated coefficient of the incrementalist variable is statistically significant at more than 95 percent confidence level. The sign is positive and in line with expectation. The impact of this variable, its probably of 0.267 indicates the relative importance of this variable. Judging from this result, the government's allocation of resources to capital expenditure has been much influenced by the precedent of the previous year's budget. Its impact is more explicit than any other variables in the equation except the (TE-INT)/GDP variable. Given that (TE-INT)/GDP represents the resources available to the government, it may be inferred that the government also relies significantly on its latest budget experience in setting current policy on capital expenditure, with little regards to other economical demographic variables such as the values added of the manufacturing sector and urbanization.

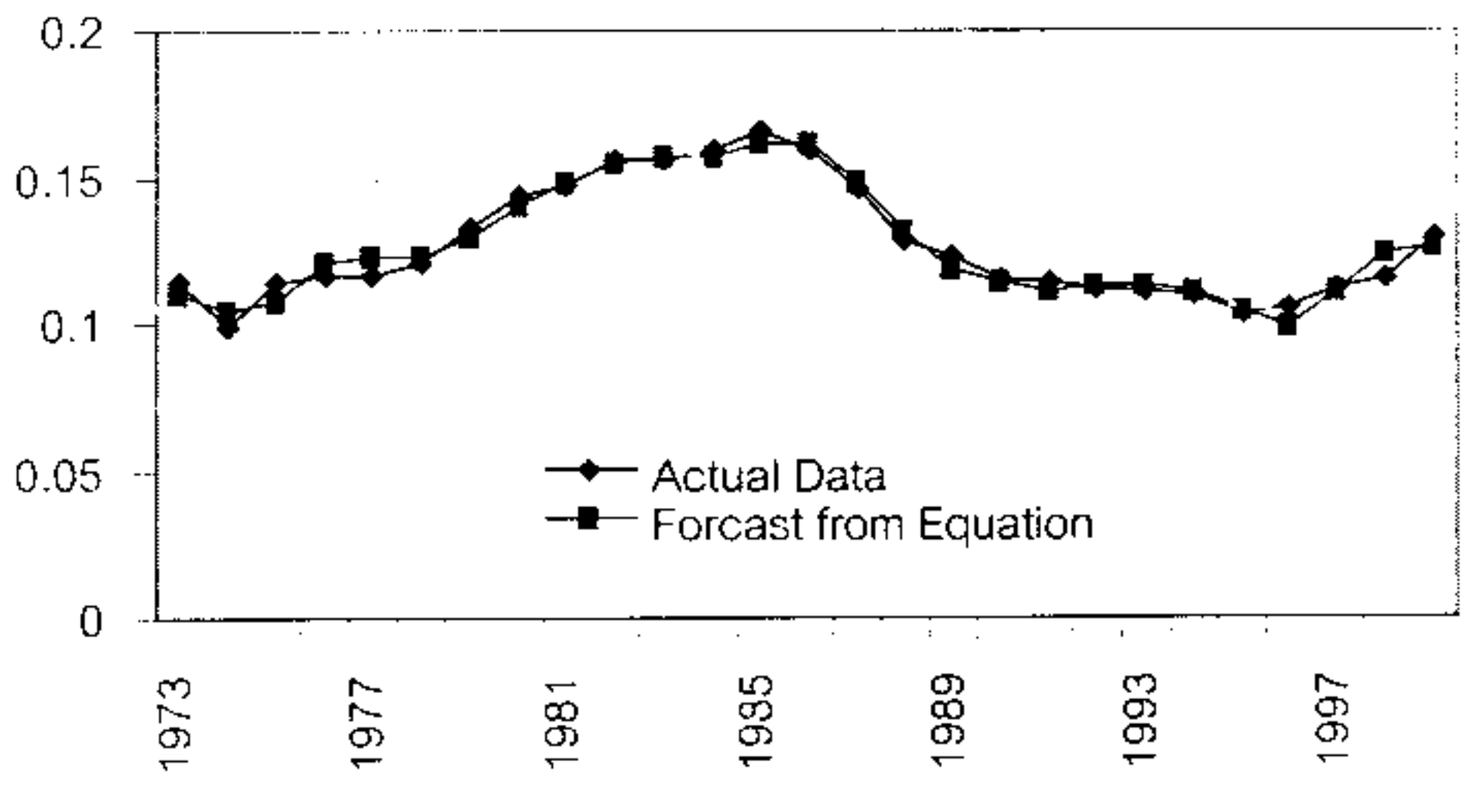
4.2 The Empirical Estimation Result of the Current Expenditure Equation

The best estimate of equation (23), presented in the Methodology Chapter is depicted as equation (23E).

$$\begin{aligned} GCUR/GDP &= 0.144 + 0.351\ (TE\text{-}INT)/GDP^{*} + 0.003DEPR^{*} - \\ &\quad (3.0) \qquad\qquad (7.9) \qquad\qquad (3.1) \\ &\quad 0.05\ MANUV^{*} + 0.597(GCUR(-1)/GDP\ (-1)^{*} \qquad (23E) \\ &\quad (4.0) \qquad\qquad (8.3) \end{aligned}$$

$$R2 = 0.96\ ,\ \text{Adjusted } R2 = 0.95\ ,\ \text{F-Statistic} = 123.0^{*}$$

Statistically, equation (23E) is significant judging from the F-statistic of more than 95 percent confidence implying that the equation adequately explains the behavior of the government current expenditure. The R^2 value shows that the 96 percent of movements of the government current expenditure can be explained by this set of independent variables. The remaining 4 percent residual terms that cannot be explained by this equation, is small and acceptable. To illustrate the goodness of fit of this equation, the actual government current expenditure forecast government current expenditure.



Graph 4.6 The Goodness of Fit of the Government Current Expenditure Equation

From graph 4.6, the goodness of fit of the estimated government current expenditure seems reasonable except for some fluctuations and deviations from the actual levels observed during the 1997 to 1999. During this period, Thailand was

under a financial crisis and subject to constraint imposed under the IMF program along with its financial support.

As for each individual independent variable found statistically significant, the total expenditure after interest payment ((TE-INT)/GDP) exerts positive effects on the current expenditure as expected. Similarly, the value added of manufacturing (MANUV) and the incrementalist variable (GCUR (-1)/GDPN (-1)) are also positively correlated with government current expenditure/GDP. Surprisingly, however, the dependency ratio (DEPR) was found to be negatively correlated with the current expenditure, which will be discussed in some more details.

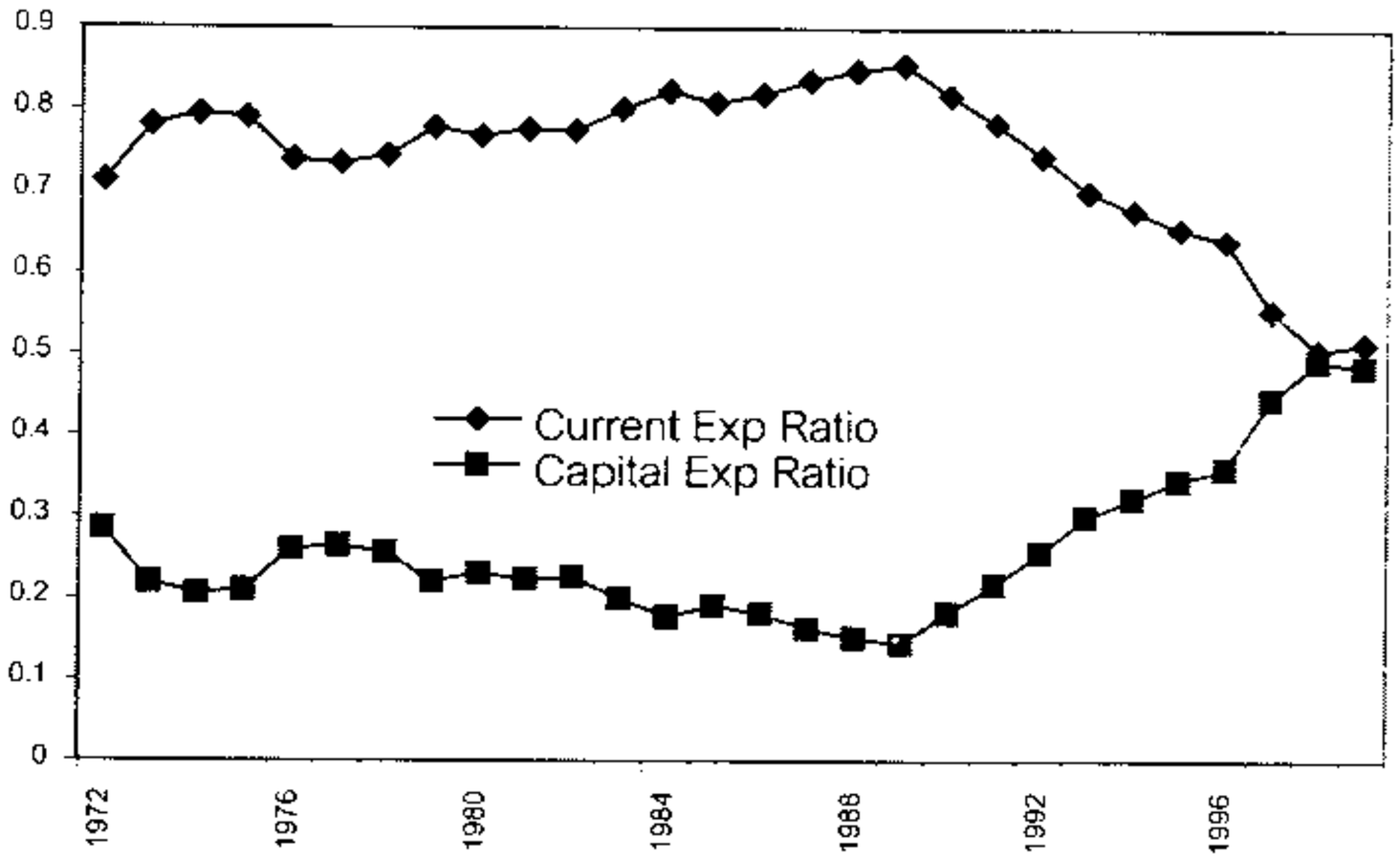
4.3 The Impacts Resources Availability Variable ((TE-INT)/GDP) and the Incrementalist Variable

These two variables show strong influences on the government current expenditure as shown in the estimated equation above. The results probably indicate the static follow the traditional kind of attitude underlying the budget process whereby the available resources and the previous year's budget play a significant role in determining both current and capital expenditure. The estimated coefficients of variables are statistically significant at more than 95 percent confidence level. The estimated signs are also is positive in line with the expectations.

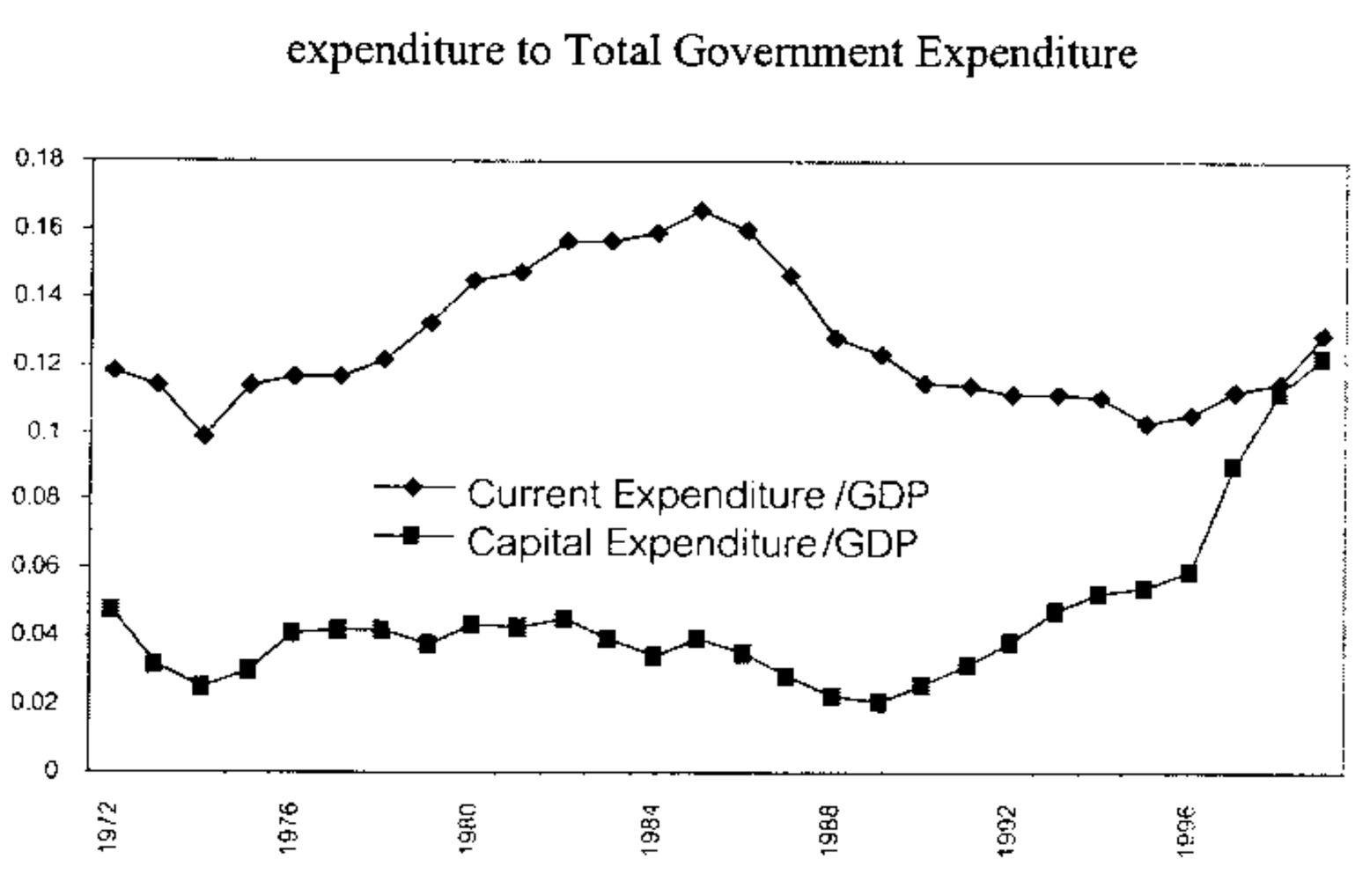
4.4 The Impact of the Value Added of the Manufacturing Sector (MANUV)

The coeefficient estimated also has a statistical significance of more than 95 percent confidence level. Their sign of coefficient however, is negative and deserve for further discussion. Since the value added in the manufacturing sector is intended to the fact that manufacturing is often more intensively in need of the infrastructure than other sectors. Hence, the sign for the coefficient on this variable is expected to be positive and more correlated with the capital expenditure than the current expenditure. As a result, despite the positive relationship found between the value added of the manufacturing sector and the government capital expenditure in equation (22E), it is unnecessary to hold true for the government current expenditure. The value added in manufacturing sector is thus theoretically more likely to be related to the government capital rather than current expenditure.

In practice, in a normal economic condition when the total expenditure is constraint, an increase in the capital expenditure can only be made possible by reducing current expenditure.



Graph 4.7 The Relationship between the government capital and current expenditure to Total Government Expenditure



Graph 4.8 The Relationship between the government capital and current expenditure relative to GDP

In graph 4.7, it is quite obvious that the movements in government current and capital expenditure are generally mutually offsetting. Relative to GDP, however, the government current and capital expenditure tend to be somewhat more correlated as

shown in graph 4.8 particularly in some short period during the time of financial crisis the 1997-1999. In economic term, this may be interpreted as a reasonable time preference function of the public sector regarding its current consumption as against future consumption represented by its investments or capital expenditure. Normally, it tends to allocate a fairly stable share of its income between the two categories of expenditure. In times of crisis, however, government may initially find it easier to cut back on its current expenditure due to the continuity nature of investment project (i.e. a half finished investment project is worth nothing) already mentioned. As these ongoing projects are completed, capital expenditure become more responsive to economic circumstances.

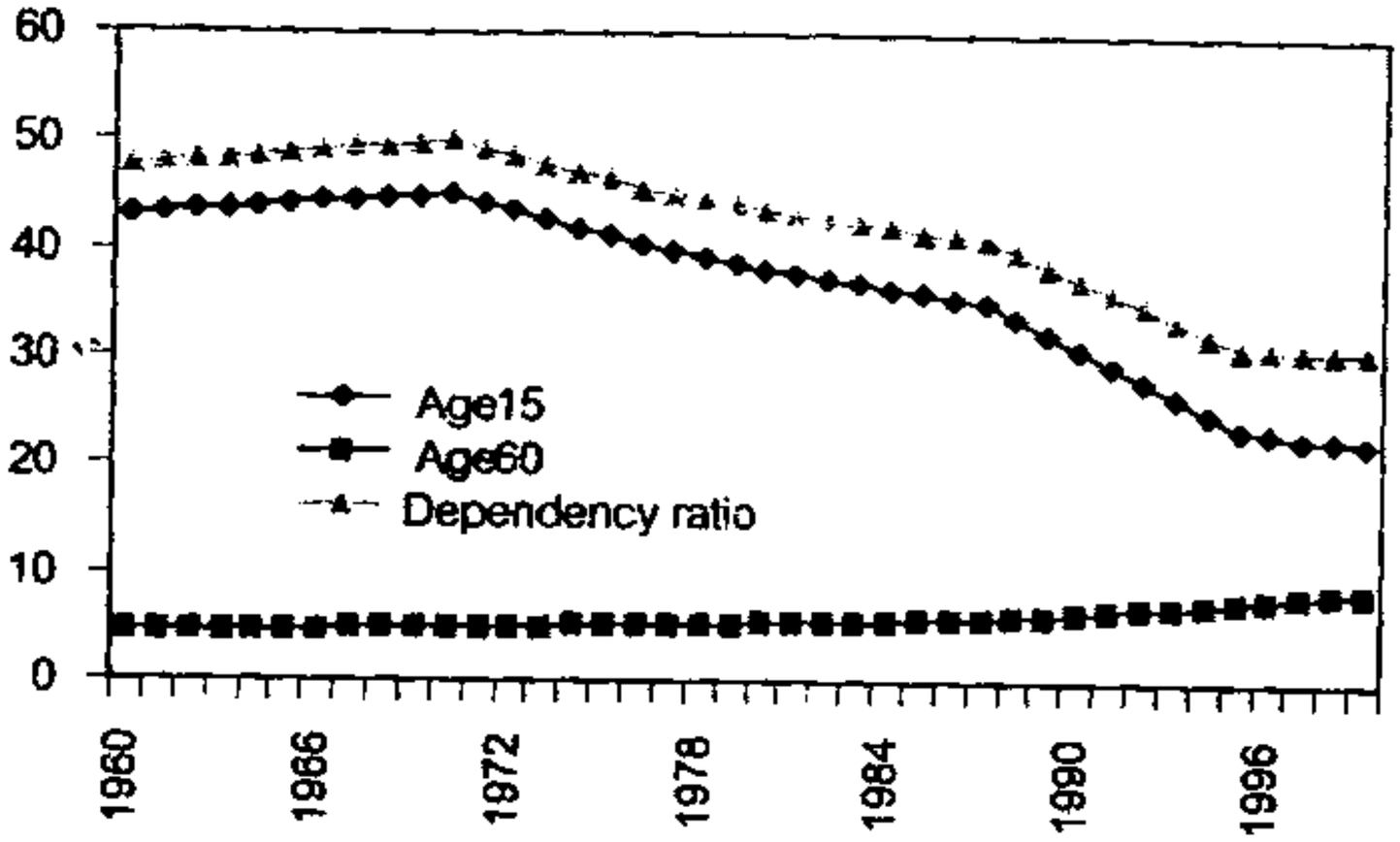
In short, an increase in the value added of manufacturing sector can induce an increased in the government capital expenditure. The relationship of the government capital and current as a proportion of the total budget tends to move in the opposite direction. As a percentage of GDP, however, an increase in the government capital expenditure tends to be more proportional to the current expenditure except perhaps in a crisis period. Following the economic boom period, nevertheless, the negative relationship between the value added in manufacturing sector and the government current expenditure to GDP probably became the most pronounced. Economically as growth shifts up future rate of return driven by the manufacturing sector, the government accordingly allocates more of its resource to future consumption (i.e. capital investment).

Similarly in a crisis environment such as during from 1997 to 1999 both the government capital and current may also go more in the same direction, implying a larger fiscal deficit as a whole during this period. It is also important to note that under such a circumstance, the government needed to enlarge its roles to compensate the shrinking private sector impaired by the crisis.

4.5 The Impacts of the Dependency Ratio (DEPR)

As for the impact of the dependency ratio on the government current expenditure, the estimated coefficient is also statistically significant at more than 95 percent confidence level. The sign of coefficient, however, indicates a negative relationship, which is rather contradictory to expectation suggested by the literature.

From Musgrave (1989), for example, it is suggested that an increase in the dependency ratio should imply a corresponding increase in government current expenditures because of higher obligations for education, health care, and pensions. However, an increase in the dependency ratio also implies a smaller share of the population paying taxes, which, in turn, could create pressures to decrease expenditure. In equation (23E), a statistically significant negative relationship is found between the dependency ratio and the government current capital expenditure in the case of Thailand. To gain a deeper understanding of this development, the dependency ratio of Thailand during 1961-1999 is plotted against the proportions of population under 15 and over 60 years old as shown in graph 4.9. From the graph, it may be seen that the dependency ratio has been declining over the past 40 years largely induces by the falling share of the population below 15 years old in line with the successful family planning policy. Although the ratio of the old have exhibited an upward trend during the period, the impact is relatively small. This results in a decline in the dependency ratio over the period of study. The government current expenditure, on the other hand, has been rising during the period reflecting the development efforts and the gradually expanding roles of the government perhaps as an employers of the working aged population. The negative relationship is therefore found with respect to the dependency ratio.



Graph 4.9 Thailand 's Dependency Ratio during 1960-1999

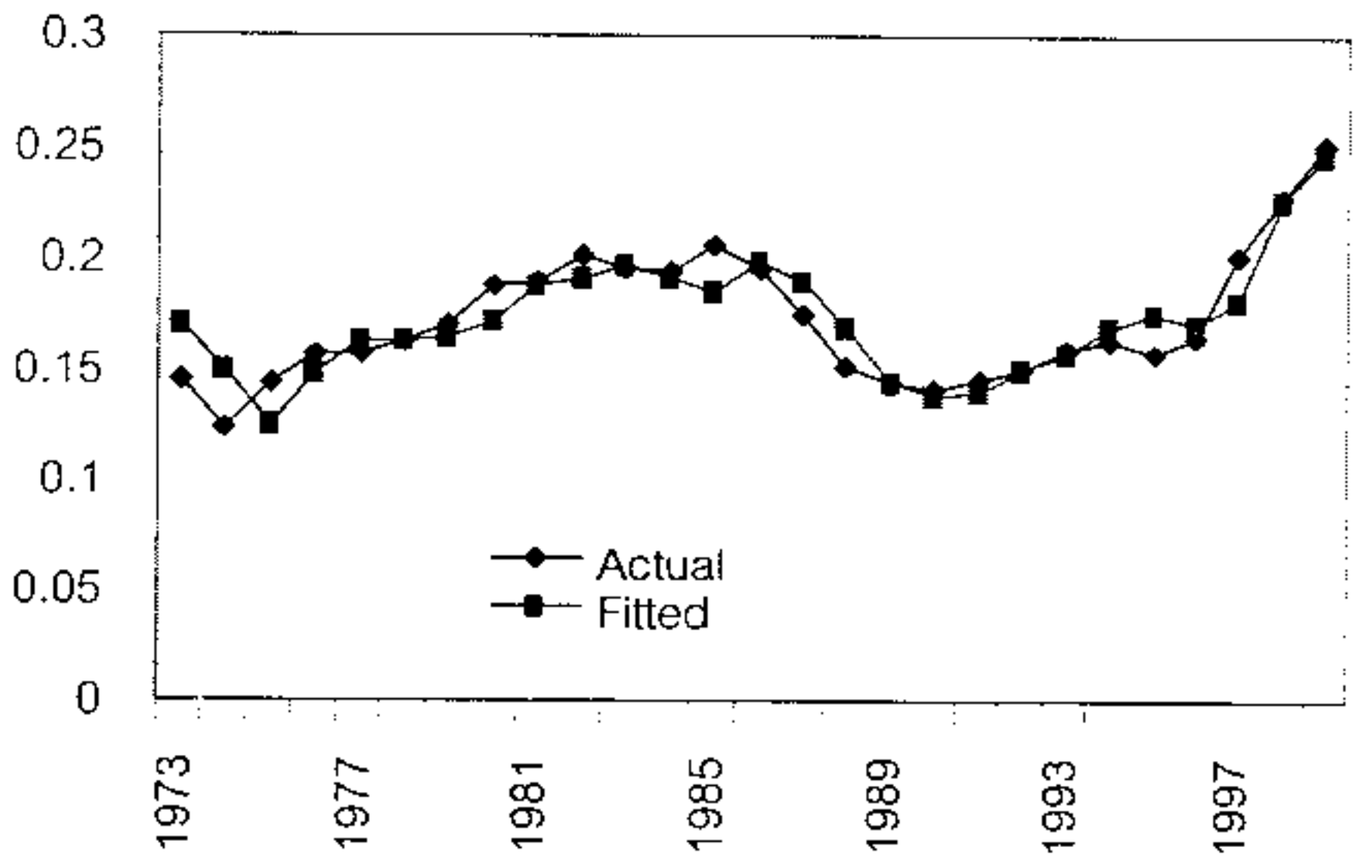
4.6 The Empirical Estimation Result of the Total Expenditure Equation

From the theoretical based equation (30), presented in the Methodology Chapter, the actual estimated form that is best fitted to the data is shown in equation (30E)

$$TE/GDP = 0.001 - 0.956\ INT/GDP^{*} + 0.048CA + 0.048(TE(-1)/GDP(-1)^{*} \quad (30E)$$
$$(0.1) \qquad (2.7) \qquad (0.6) \qquad (7.6)$$
$$R^2 = 0.82\ ,\ \text{Adjusted } R^2 = 0.80\ ,\ \text{F-Statistic} = 35.9^{*}$$

Statistically, equation (30E) significant shown by the F-statistic of more than 95 percent implying that the equation can reasonably explain the behavior of the government current expenditure. The t-statistics in the brackets below the coeficients of the independent variables (except CA to be discussed later) confirm that in equation (30E) these parameters are statistical different from zero, implying that all the independent variables contribute to the explanation of the behavior of the government current expenditure allocation. The R^2 value reflects that 82 percent of the movements in the total government expenditure can be explained by this set of independent variables. The remaining rather high but acceptable 18 percent cannot be explained by this equation. To illustrate further how each of the independent variables in the equation can explain the changes in the government total expenditure, the government

total expenditure from 1973 to 2000 is plotted against the equation forecast levels as shown in graph 4.10.



Graph 4.10 The Goodness of Fit of the Government Total Expenditure Equation

The goodness of fit of this equation (graph 4.10) is slightly less than these of government current and capital expenditure equations. Correspondingly, the R^2 of this equation is only 82 percent compared to around 95-96 percent of the previous two equations. It is partly because equation (30E) is more aggregated and thus can be less explained the other two equations, which are based on more, disaggregated and thus more homogenized behavior data. In addition, the number of applicable conditions variables in the aggregated equation is limited since each conditions variable can explain only parts of the aggregate equation such as the value added in the manufacturing sector explaining the capital expenditure, and the dependency ratio elaborating the current expenditure.

4.7 The Impact of the Interest Payment on the Government Total Expenditure

The estimated coefficient of the interest payment on the total expenditure is high (close to unity) probably reflecting the strong influence that the government interest payment has on the determination of the government total expenditure. The negative sign implies that a rise in the government interest payment will tend to

induce a corresponding decline in the total expenditure forcing the government to make major adjustments to its fiscal plans. The result is somewhat different from the cross section analysis by Hewitt 1991 where it is found that a rise in the interest payment positively leads to a larger size of the government expenditure.

This positive or negative impact of the interest payment has a significant implication for the policy direction of the government. In a country where the fiscal policy is more rigid, facing a lot of difficulties or political constraints, fiscal adjustments irregard of interest payments will be difficult to come by even when facing economic difficulties. Therefore, such a country facing economic challenges will be more inclined to respond by hiking the government debt that will lead to huge sums of annual interest payments. Some of these countries can be found among the Latin Americas e.g. during the debt crisis of the 1980's.

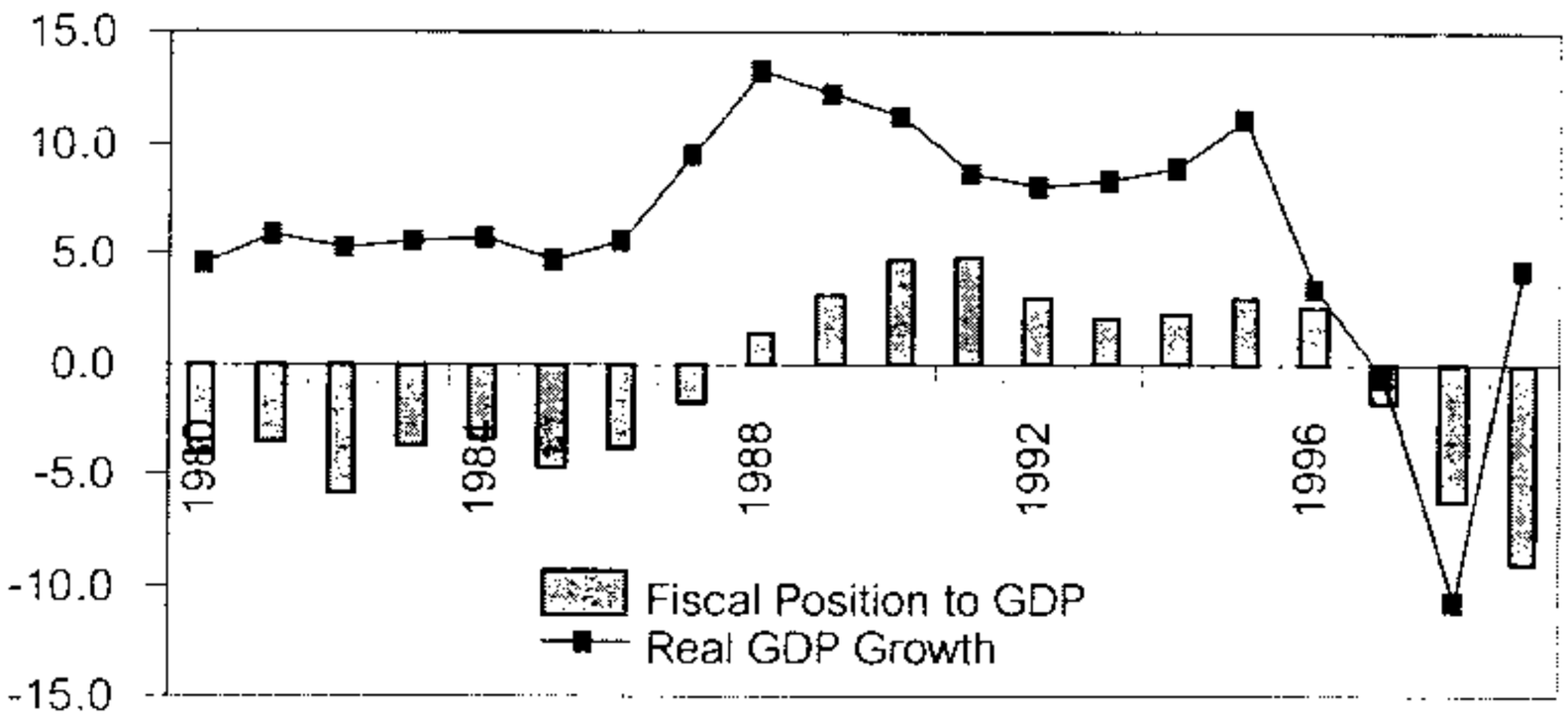
The negative relationship between the government interest payment and the total expenditure to GDP in the case of Thailand under the period of study of 1972-1999 implies a significant behavioral trait regarding Thailand's past fiscal policy determination. First, it implies that fiscal adjustments usually took place in the period when the country was facing a crisis. Further, reflecting perhaps a fairly strong fiscal discipline, once the interest payment increases, a fiscal policy consolidation often follows through cut backs in other types of expenditure. To support this argument three additional pieces of evidences will be discussed to illustrate the ability of the government in adjusting its fiscal policy in response to changing economic conditions.

4.7.1 The Thai fiscal policy is conservatism

The past performance of the Thai fiscal policy is probably best described in a study by the World Bank which concludes that: " Thai fiscal policy can generally be characterized by fiscal conservatism. The government is legally restrained from running a large deficit, and fiscal policy has traditionally played a stabilizing role on the economy. This conservatism served it well during the boom years , when fiscal policy provided a healthy macroeconomic environment for growth" (World Bank, 2000).

4.7.2 The elasticity of the Thai fiscal policy adjustment

Since the middle 1970s to the period just before financial crisis in 1997, Thai fiscal policy did provide a healthy macroeconomic environment for growth as well as achievements in economic and social development (World Bank, 2000 and Pisit Leeahtam, 1991). Thai economy grew annually at an average rate of 8 percent. The government cash position showed nine consecutive years of surplus during 1987 to 1996. Although during this boom period the private sector expanded its investment by borrowing from abroad to push further the economic boom, the surpluses in public sector helped to absorb and moderate the overheating economy in the private sector and thus inflation pressure during the period. The degree of the fiscal flexibility is shown in Graph 4.11. From this graph, the ability of the fiscal policy to stabilize macro economic condition via a counter-cyclical fiscal strategy which produces fiscal surpluses in the boom years and deficits in the low growth years. As the economic activities slowed down, fiscal surplus also declined and ultimately turned into deficits when the crisis emerged. For example, from 1996 to 1997, as the annual economic growth rate fell from 6.4 percent to 0.6 percent, the fiscal balance swung from a 2.2 percent surplus to a 1.7 percent deficit relative to GDP.



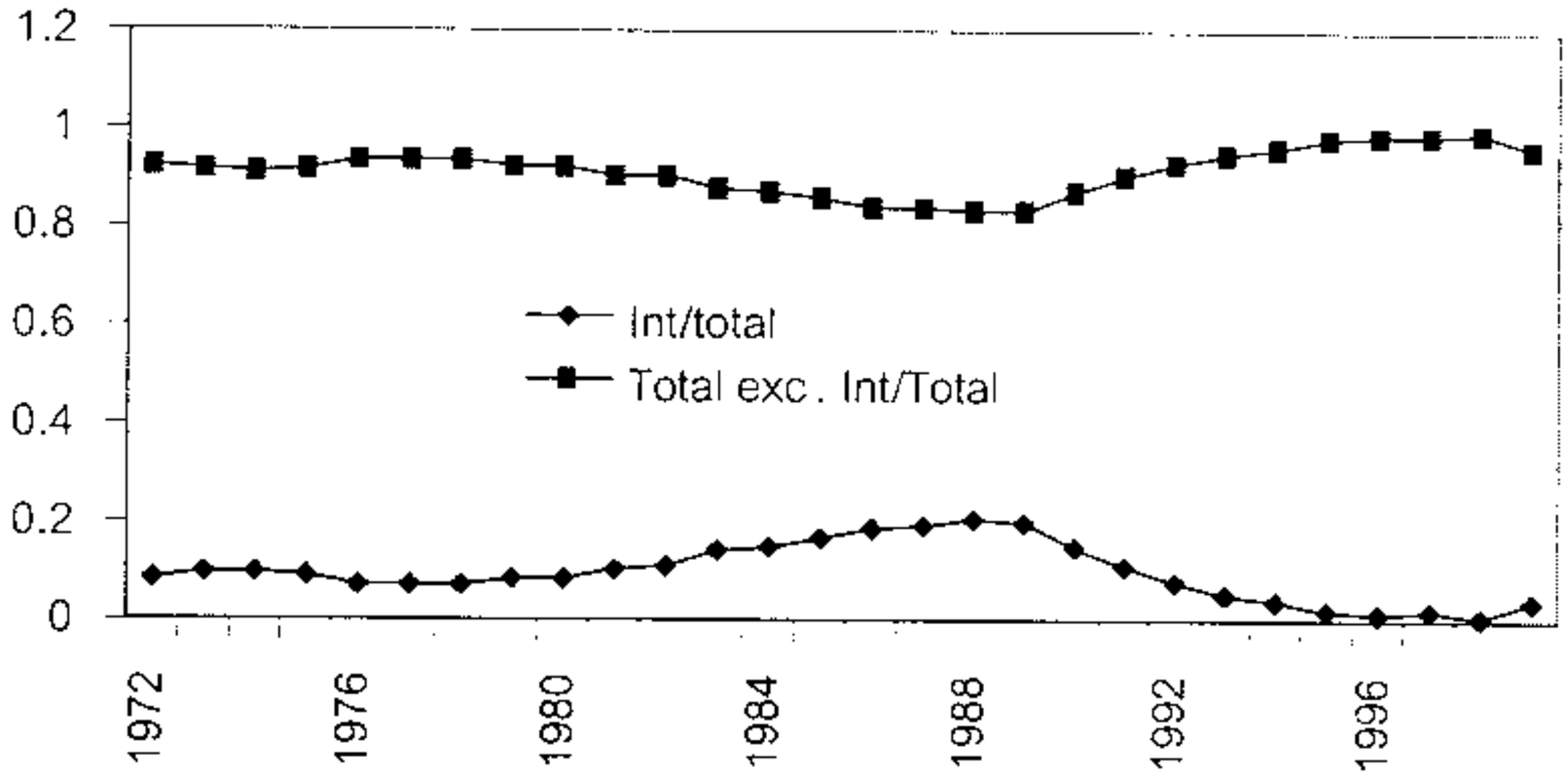
Graph 4.11 The flexibility of Fiscal Policy to Economic Condition

4.7.3 The elasticity of the other types of expenditure to offset an increase in interest payment

To show the ability of the government to adjust other types of expenditure when it faces a higher interest payment in Graph 4.12, the government total expenditure after interest payment is plotted along with the interest payment expenditure as a percentage of total expenditure. The graph confirms that at the time of crisis such as during the first oil shock in early 1970s and during second oil shock in late 1970s as well as the recent crisis in 1997, the government normally responded to such crises by cutting down its non-interest expenditure to offset the increase in the interest payment, given that the total expenditure was constraint by a limit on its fiscal deficit. This behavior was quite obvious during the 1980s.

The government fiscal adjustment has probably shown the greastest elasticity when the zero growth budget were implemented for FY 1986 and FY 1987. In such a situation when interest payment obligations were increasing due to the preceding accumulation of the public debt, the zero growth budget implied that the non-interest expenditure had to be cut down dramatically. As for government's borrowings from abroad, as a consequence of the second oil crisis in the late 1970s and early 1980s, external debt ceiling were also introduced effectively starting from FY 1986.

In the last three years of the 1980s, the economy began to turn around largely due to the influx of the capital from abroad; the government registered a large increase in revenue resulting in a huge surplus in each of the last three years. During this period, the government took the opportunity to restructure its public debt by early repayments as well as refinancing of external debts so as to reduce effective interest costs and to lengthen the maturity profile.



Graph 4.12 The fiscal adjustment in respond to Interest Payment Increase

4.7.4 The annual budgetary mechanism of Thailand

It is required by law, under the Budget Procedure Act B.E. 2502, that the annual budget include the principal repayment. Under this law, when a debt repayment is due the government has to earmark the corresponding amount in its annual budget. As a consequence of this, Thai budget deficits tend to be lager than the equivalent amounts under international standard practices. According to the GFS manual 1986, in particular, debt repayment is treated as an 'under-the-line' item where a change in the repayment will not affect the expenditure only government's liability. The definition and scope of 'expenditure' adopted in this study follow that of the GFS basis.

In actual practice, nevertheless, since the annual budget of Thailand does include the principal repayment, in times of crises when the interest payment eats up into the bigger proportion of the budget, the non-interest expenditure proportion may be perceived to constrained by the amount of the principal repayment. As a result, the discretionary parts of the government expenditures can be affected and have to be cut down due to the constraint imposed by the pre-commitment expenditure (interest +principal repayments) resulting from the inclusion of the principal repayment item in the annual budget.

To sum up findings from the investigation of the Thai fiscal history above, it may be concluded that the flexibility of fiscal policy in a difficult period has been plenty demonstrated by its curtailing the total expenditure, the implementation of zero growth budget as well as the incorporation of principal repayment in the annual budgetary system. All these had contributed to the negative relationship between the size of government interest payment and the total non-interest expenditure.

4.8 The Impacts of the Current Account (CA)

The estimated coefficient of current account is insignificant relationship implying perhaps no systematic relationship between the current account deficit and the government total expenditure allocation. In theory current account can have impacts on the government expenditure by augmenting the availability of resources from abroad. The current account deficit, which corresponds to an import if capital funds from foreign countries, could exert a positive impact on the expenditure allocation through the supply side of the funds. However, in the case of Thailand the role of foreign financed expenditure has been rather limited due to two reasons:

1) Thus far, the Thai Government has never borrowed from aboard to finance its budget deficit, even if the Budget Procedure Act 1959 does not prohibit this option. Based on the conservatism of the technocrats typically the officials of the Ministry of Finance, directly responsible for selecting financing sources, the borrowing from aboard has been treated as only exceptional cases. These officials normally attempt to match the bath-denominated expenditure allocated from the budget with the bath domestic sources of financing domestically in bath currency.

2) Although the Thai Government is entitled to borrow from abroad through the Ministry of Finance to finance its investment projects outside the regular annual budgetary expenditure, the Ministry of Finance has traditionally utilized this channel with great cautions. To safeguard against absuses, a ceiling on this borrowing has been imposed to be no more than 10% of the annual budget. In practice, the Ministry of Finance borrowed even less from aboard than this ceiling. Largely, this channel has been used to borrow and relend to the state enterprises to minimize interest costs.

In this case, the money borrowed from abroad will not be used as government expenditure but state enterprise expenditure.

The empirical relationship between the current account and the total government expenditure relative to GDP may not be as clear in Thailand as in the case of other countries such as in the Latin America. As long as the domestic financing of the expenditure is not scarce the Thai government rarely seeks to finance its spending from abroad. Therefore, it is probably not surprising to find that the impact through supply side of fund or the current account on the government expenditure is not particularly significant.

Most borrowings from abroad have been done by the private sector. Private sector accounts for around 75 percent of total external debt whereas the government sector excluding the state enterprises accounts for only 10 percent. This fact thus confirms that the government exercises great caution in utilizing the external funds to finance its expenditure.

4.9 The Empirical Estimation Result of the Remaining Six Equations

After the empirical results of the three main equations have already been presented above, attention is turned in this sub-section to the empirical results of the remaining six sub-categories of the government expenditures; namely, expenditures for economic affairs, education, health, social and welfares, goods and services and expenditure on wages and salaries as appeared in equations (24) to (29). The summaries of these empirical results are presented in table 4.1.

Table 4.1 The Result s of the estimated Equations

Government Expenditure	Equation	Adjust R^2	F Stat.
Capital Expendi-ture	GCAP/GDP = 0.05 + 0.316 (TE-INT)/GDP* - 0.0004 OPEN* (2.05) (3.87) (-2.31) +0.045 MANUV* - 0.0006 URB* + 0.267 (GCAP(-1)/GDP(-1))* (6.27) (-2.56) (2.61) -0.483 AR(1) (2.29)	0.98	239.1*
Current Expendi-ture	GCUR/GDP = 0.144 + 0.351 (TE-INT)/GDP* - 0.003 DEPR* (2.99) (7.90) (-3.12) -0.05 MANUV* + 0.597 (GCUR(-1)/GDP(-1))* (-3.97) (8.26)	0.95	123.0*
Total Expendi-ture	TE/GDP = 0.002 - 0.956 INT/GDP* + 0.048 CA/GDP (0.07) (-2.72) (0.62) + 1.099 (TE (-1)/GDP(-1))* (7.56)	0.80	35.9*
Economic Affair	E_affair/GDP = 0.008 + 0.201 (TE-INT)/GDP* - 0.004 OPEN* (0.45) (2.09) (-2.50) +0.00 MANUV* + 0.439 (E_Affair(-1)/GDP(-1))* - 0.182 AR(2) (3.87) (2.33) (-0.72)	0.93	62.5*
Education	EDUCA/GDP = 0.05 + 0.122 (TE-INT)/GDP* + 0.00 AGE15 (1.36) (5.67) (0.68) + 0.76 (EDUCA (-1)/GDP(-1))* (3.87)	0.86	54.9*
Health	HEALTH/GDP = -0.004 + 0.176 (TE-INT)/GDP* + (-2.84) (2.25) 0.001 AGE60* + 0.602 (HEALTH (-1)/GDP(-1))* (2.79) (4.57)	0.93	111.8*
Social and Welfare	Social_Welf/GDP = -0.008 + 0.007 (TE-INT)/GDP* + (-2.62) (2.08) 0.0002 DEPR* + 0.000 MANUV* + (2.2.86) (3.07) 0.466 (Social_Welf (-1)/GDP(-1))* (2.89)	0.73	19.0*
Goods and Services	Goods_Serv/GDP = 0.025 + 0.173 (TE-INT)/GDP* + (1.58) (2.41) 0.602 (Goods_Serv (-1)/GDP(-1))* +0.001 AR(1)* (2.11) (4.04)	0.93	90.2*
Wages and Salaries	WAGE/GDP = 0.061 + 0.112 (TE-INT)/GDP* - 0.001 DEPR* - (2.08) (3.94) (-2.22) 0.00 MANUV* + 0.686 (WAGE(-1)/GDP(-1))* (2.08) (6.95)	0.89	52.8

Note: for Table 4.1: (1) The symbol asterisks mean that the variable (s) is significant at 95 percent confidence level. (2) The numbers in parentheses are the t- statistics. (3) Due to the limitation

of the Durbin Watson statistic, the Q statistic method is applied instead to test for the autocorrelation (details of discussions see chapter 4 :Methodology. The empirical details of these Q statistics of all equations are presented in the Appendix 1). (4) Using Q statistic, special data method is employ to transformation make sure that all equations presented are free from the problem of autocorrelation.

The empirical results of all nine equations have been presented in the table 4.1. Since the first three equations have been already discussed, the following analysis will focus on the six remaining equations.

1. All six equations are significant at 95 percent confidence level judging from their F-statistics in table 4.1. In each equation, the chosen sets of independent variables can explain the behavior of the government expenditure satisfactorily.

2. The overall R^2s are reasonably high from 73 percent in the social and welfare expenditure equation to the 93 percent in the economic affair, health and good and service expenditure equations. They provide an adequate basis for further analysis and discussion.

3. In line with the estimated results of the government capital, current and total expenditure equations, the resources available for all expenditures after interest payment (TE-INT)/GDP, and the incrementalist variables still play a significant role in allocating these types of expenditures. This is true, whether looking from economic classification (which divides government expenditure into capital and current expenditure), or analyzing from the functional classifications (which divide government expenditure into economic affairs, education, health, social and welfare, and so on). The total size of the government expenditure in the economy and the base of last's year expenditure have thus been monitored closely used by the policy makers in allocating the government expenditure.

4. The incrementalist variable or the last year's base affect has influenced the allocation of current expenditure relatively more than capital expenditure. This perhaps implies relatively higher rigidity in the current expenditure. This kind of characteristics is also found in the other types of current expenditures including the wages and salaries. The influence of the incrementalist variable is the least for the government capital expenditure implying probably the most flexibility in adjusting the government capital expenditure. How flexible the government capital expenditure

actually is compared with the government current expenditure and their positive and negative consequences will be discussed in the last section of this chapter.

5. The value added in the manufacturing sector has been found statistically significant in determining the capital expenditure and capital-based expenditure such as the economic affairs expenditure. This result indicates that the increased government capital expenditure is associated with the manufacturing activities. The larger proportions of the manufacturing sector have made the economic structure more sophisticated and thus need for more infrastructures, which has to be provided by the increased government capital expenditure. The results also show that among the demographic variable tested in the study. the value added in the manufacturing sector probably has the strongest effects compared with the others. In addition, the value added in manufacturing sector also appears to influence the allocation of resources to wages and salaries. The increased waged and salaries in line with the value added in the manufacturing sector may run through either direct or indirect channels. The most direct channel is probably as manufacturing sector complicates also the economic structure, it will also raise demand for more civil servants. As for the indirect channel, the development of the manufacturing sector will tend to increase wages and salaries in the private sector. To contain the brain drain from the government, it also has to pay more wages to civil servants although possibly to a lesser extent than the private sector. The specific incident retaking to this point, for example, is the 16.7 percent increase in the wage and salary expenditure of the government sector in the period of 1988-1992.

6. The role of the external sector is limited on public sector reflected by the coefficients of the external sector variables such as the degree of openness and the current account deficit. This result is in line with the estimation result of the role of the current account deficit on the government total expenditure. The limited role of the external sector has already been discussed in the government total expenditure equation.

7. The dependency ratio does not generally play a significant role in determining government current expenditure allocation. Since the dependency ratio in Thailand has declined consistently for the past 40 years (see graph 4.9 also). However if further disaggregate is allowed, the share of the old (aged over 60) has

significantly impacts on the allocation to the health expenditure while the share of the young has significant influences on the government expenditure for education in line with the government policy to provide all the compulsory education level free of charge. Although the dependency ratio does not affect the government current expenditure as a whole, it has significant impacts on the social and welfare expenditure. This kind of expenditure includes the subsidy for the poor and the under-privileged persons.

4.10 Overview and Some Implications From the Empirical Results

After investigating the empirical results, it may be inferred that the government expenditure as well as its compositions in the past follow specific patterns and are not in a random or taken for granted as 'exogenous' as normally proposed in conventional economic studies. These expenditures are logically motivated by self-interest and by the government's perception of the state of the economy as well as other social and demographic conditions.

All nine equations estimated confirm that we can explain the government expenditure behaviors reasonably well. In all nine equations, the size of total expenditure after interest payment, the size of the interest payment in the budget and the incrementalist variables have all played significant roles in determining the government expenditure. The demographic variables also show some statistical influences on the government expenditure. Different demographic variable, however, have different impacts on different types of expenditure. Among others, the value added in manufacturing sector has played the important role in determining various kind of expenditure particularly the capital expenditure and expenditure on economic affairs. Dependency ratio also shows statistically some impacts on the expenditure for social and welfare. As expected, the ratio of the young people influences the expenditure for education, and the ratio of the old affects the expenditure for health. The included external factors of both the degree of openness and the current account are not statically significant in determining the government expenditure allocation as found in other studies. A deeper investigation of the period of analysis reveals that the government never borrows from abroad to finance its budget deficit and these external borrowings under the law are usually limited constraint the government to

use it with cautions. Unlike other countries, the roles of government to borrow on behalf of the private sector for reducing the private external exposure are very scarce in Thailand. These factors together reduce the influences of the external factor variables. It should be restated that the incrementalist variable or the last year's base level has influenced the allocation of current expenditure relatively more than capital expenditure. This implies the less flexibility of the current expenditure. This kind of characteristics is also found in the various kinds of current based expenditure including wages and salaries equation. The influence of the incrementalist variable is the least for the government capital expenditure implying again the most flexibility in adjusting this category of expenditure. The flexibility and inflexibility of these government capital and current expenditures have the following implications:

1. The current expenditure is expected to persist or increase in proportion over time as implied by the large positive coefficient of the incrementalist variable. If the economy is in difficulties, the government thus tends to adjust the capital expenditure. Since the capital expenditure occupies a small proportion in the budget, given the amount of expenditure being cut down, the government implicitly has to cut down its capital expenditure more drastically in terms of the proportion to the budget. Unless the economic recovery makes it possible for the government to get more revenue to finance its capital expenditure, the capital expenditure will normally be cut first in recession. This behavioral trait can be pro cyclical and detrimental to long term growth prospects of the economy.

2. During a economic slowdown, the capital expenditure is obviously needed to boost the economy as well as to lay down infrastructure for future growth much more urgently than the time of economic prosperity. However, this is unlikely to take place given the relatively more inelastic of the current expenditure.

3. The larger proportion of the current expenditure as a result of the based years' effect will pose even more inflexibility to the government behavior in implementing its fiscal policy in response to the various shocks to the economic conditions.

The size of the interest payment is found negatively related to the government expenditure, attributable to three main factors as: first the conservatism of the Thai

fiscal policy in the past, second the flexibility of the Thai fiscal adjustment ; and third is the ability to adjust non-interest expenditure in the time of hiking interest payments.

CHAPTER 5

FURTHER INVESTIGATIONS OF THE DETERMINANTS OF THE GOVERNMENT EXPENDITURE

With due regards to the limitations as well as the inflexibility of the results from the regression analysis, a further investigative analysis is performed in this chapter to incorporate other factors that have not been captured by the quantitative regression analysis. The analysis in this chapter therefore aims to compliment the regression analysis results discussed in the previous chapter. This chapter is divided into 4 sub-sections. The first sub-section shows a number of causality tests to see the directions of linkages from the independent variables to the government expenditure determination. In the second sub-section, another causality test is performed between the government revenue and government expenditure. In the third sub-section, the historical discussions of the relationships between economic development, growth, and the government expenditure are presented for 4 sub-periods between 1960 and 2000. In the last sub-section, the annual budgetary process is described in details along with the institutional factors determining the government expenditure. Here, the influences of the institutional aspects of government policy as well as the other factors they taken into considerations in the annual government expenditure will be investigated.

5.1 The Causality Test

In this sub-section, a causality test based on purely statistical techniques not economic theory is performed to gain a further insight into the relationships between the independent variables. This technique is intended only as a supplement key tool after a significant relationship has already been found from the standard regression method. It cannot and thus is not intended to replace but to reconfirm the relationships found from the standard regression method.

This method has been developed by Granger and normally called Granger Causality Test. Supposing x(s) represent a set of independent variables and y represents the dependent variable, the Granger Causality test is simply to examine how much of the current y movements can be explained by the past values of y and then to see whether adding lagged values of x can improve this explanatory power. Y is then said to be caused by x if x helps to improve the prediction of y, or equivalently if the coefficient(s) on the lagged values of x(s) are statistically significant.

In practice, the causality test can be applied to all independent variables except the incrementalist variable because the Granger Causality method uses lagged variable to determine the causality, which happens to be the same variable as the incrementalist. The final results are shown in table 6.1. Some important inferences drawn are as follows:

1. The factors determining government capital expenditure including government total expenditure after interest payment, the value added in the manufacturing sector, and the degree of openness are found to cause the government capital expenditure.

2. Government interest payment to government total expenditure (INT/TE) is found to have a two ways' relationship with the government total expenditure. According to the Granger Causality test, this means that the setting of the government total expenditure both affected and was affected by the size of interest costs at the same time.

3. The economic affair expenditure is found to depend on the government total expenditure after interest payment as well as the value added in the manufacturing sector.

4. In line with the regression result, the education expenditure is found to be caused by the government total expenditure after interest payment and the ratio of people less than 15 years of age.

5. The government total expenditure after interest payment and in particular the ratio of people over 60 years old are found to cause the expenditure for health.

6. The value added in the manufacturing sector and especially the dependency ratio are found to cause the allocation of resources to the government social and welfare expenditure. Although at less than 95 percent level of confidence, the

government total expenditure after interest payment are found to cause the social and welfare expenditure at 90 percent level of confidence.

7. The government total expenditure after interest payment also appears to cause the allocation of the wage and salary expenditure

In short, the overall results of the additional causality test are in line with the regression results. The important variable such as the size of government total expenditure after interest cost, the size of the interest payment, the value added in the manufacturing sector as well as the demographic variables such as the dependency ratio and the ratio of people under 15 and over 60 are found to play significant roles in causing the government expenditure determination.

Table 5.1 Causality Test

Dependent Variable	Independent Variable	F-stat	Probability	Significant Cause
1GCAP/GDP	(TE-INT)/GDP	3.47	0.05	Yes*
	OPEN	4.41	0.03	Yes*
	URB	0.86	0.44	No
	MANUV	4.79	0.02	Yes*
2GCUR/GDP	(TE-INT)/GDP	1.21	0.32	No
	DEPR	1.65	0.22	No
	MANUV	1.12	0.35	No
3E-AFFAIR/GDP	(TE-INT)/GDP	4.99	0.01	Yes*
	OPEN	2.08	0.13	No
	MANUV	4.28	0.02	Yes*
4EDUCA/GDP	(TE-INT)/GDP	4.62	0.02	Yes*
	AGE15	6.37	0.01	Yes*
5HEALTH/GDP	(TE-INT)/GDP	3.83	0.06	Yes**
	AGE60	5.73	0.02	Yes*

Table 5.1 (continued)

Dependent Variable	Independent Variable	F-stat	Probability	Significant Cause
6SOCIAL_WELF/GDP	(TE-INT)/GDP	2.57	0.10	Yes**
	DEPR	6.00	0.01	Yes*
7GOODS_SERV/GDP	(TE-INT)/GDP	1.17	0.33	No
8WAGE/GDP	(TE-INT)/GDP	2.65	0.09	Yes**
	DEPR	1.68	0.21	No
	MANUV	1.38	0.27	No
9TE/GDP	INT/GDP	3.53	0.05	Yes*

Note: * Significant at 95% confident level

: ** Significant at 90% confident level

5.2 The Relationships Between of Government Revenue and the Government Allocation

"Does the revenue cause expenditure or vice versa?" is the key question to be addressed in this part of the study. Although revenue is not included as an independent variable in the regression models, it certainly plays a critical role politically and in terms of the budgetary process.

Rangsan Tanapornpaun (1998) discussed qualitatively about the process of the government budget determination. In his study, the two alternative link between expenditure and revenue may be described as follows: in order to meet a set of objectives, the government may determine the level of expenditure needed first and then thinking about the level of revenue and financing (if any) later. As for the revenue determining expenditure, on the other hand, the government will calculate (project) the revenue first and then try to set up the level of expenditure in line with the revenue expected to be collectible. Under the expenditure causing revenue hypothesis, the government would tend to spend more extravagantly. He concluded

that the process of Thailand's budget determination can be either revenue causing expenditure or expenditure causing revenue depending on the political factors, which vary over time. He noted that during an election, government tends to be more extravagant and elected governments also tend to spend more than the government having from a technocrat background. In addition, the background of the government's economic team and economic advisors are also important in determining expenditure direction.

Do the expenditure causes revenue or revenue cause expenditure: A Causality Test?

Using the causality test during the period of 1972 to 1999, it is found that in terms of government revenue over GDP and the government expenditure over GDP ratios, the relationships are two ways, which means that they reciprocate each other. In nominal terms not as a percentage of GDP, the government revenue and government expenditure, it is found that only expenditure causes revenue, which means that the government will first determine the level of expenditure to meet its objectives and then estimate how much revenue can be collected and search for the way to finance the deficit (when necessary). The details of the test results are shown in table 5.2. Therefore, in terms of statistical causality test over the period of 1972 to 1999, the results are inconclusive on the causative links between the government expenditure and revenue.

Table 5.2 Causative Relationships Between Government Revenue and Expenditure

Dependent Variable	Independent Variable	F-Statistic	Probability	Significant Cause
1.GREV/GDP	TE/GDP	4.68	0.03	Yes*
TE/GDP	GREV/GDP	3.43	0.06	Yes**
2.GREV	TE	6.65	0.01	Yes*
TE	GREV	1.83	0.21	No

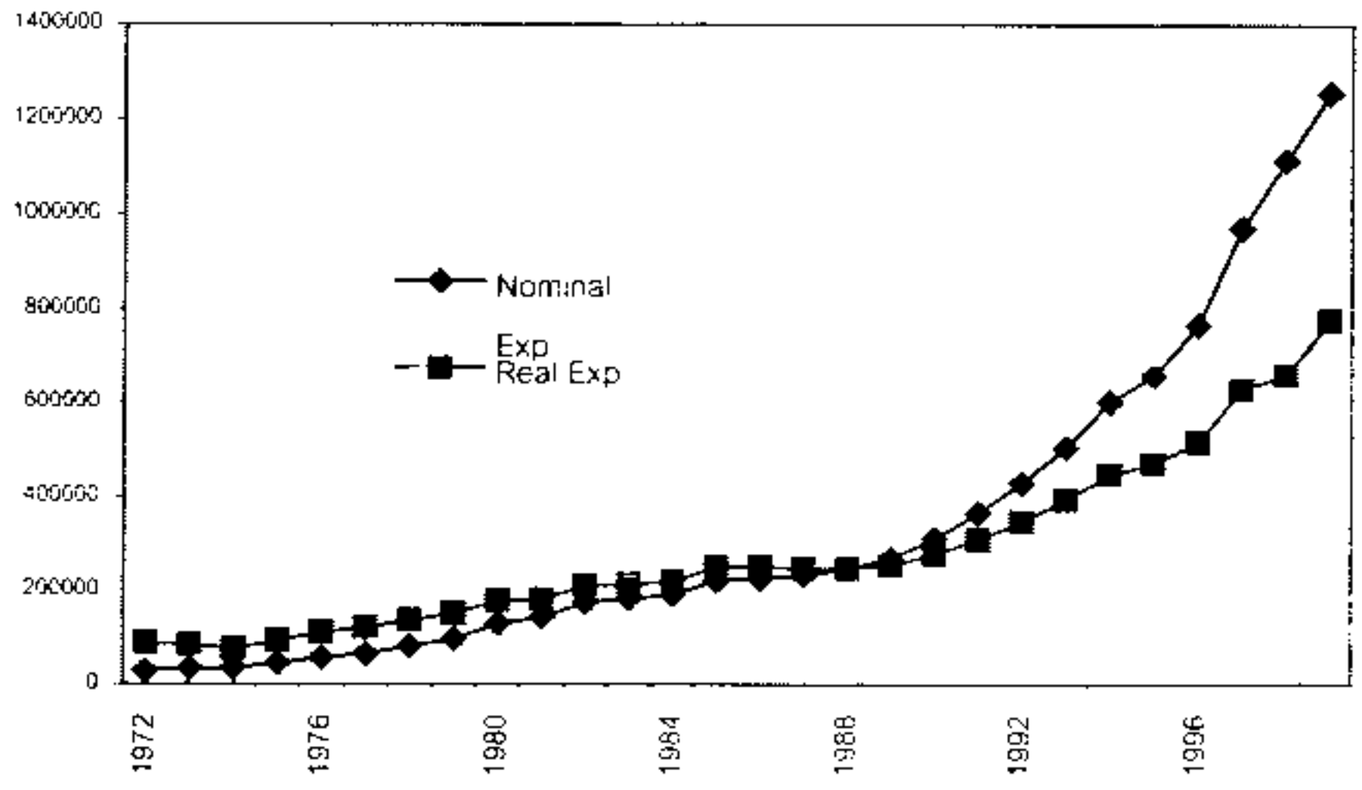
Note: * Significant at 95% confident level

: ** Significant at 90% confident level

5.3 Intertemporal Developments of the Government Expenditure

The German economist, Adolph Wagner (Peacock and Wiseman, 1967) originally proposed a law of rising expenditure. He claimed that a country should expect continual expansion of the public sector and its share in the economy. His reasons to this continual growth is that the development of modern industrial society will give rise to increasing political pressure for social welfare, and call for increased allowances for social considerations in the conduct of policy. In this sub section, the development pattern of government expenditure will be presented to see whether it follows the law of Wagner, both in absolute, real term and as a percentage of GDP.

In nominal baht terms, it is true that the amount of expenditure has been increasing continuously but it is meaningless because it may increase from the effects of prices without any corresponding increase in the real term. For example, the government may have had to add more expenditure because the prices of goods and services went up. In this case, even when the government supplies more money to the markets, it is still buying the same amount of goods and services despite the hike in expenditure in nominal or in baht terms. A more meaningful analysis would therefore be to look into the real terms of the government expenditure. The 'real terms' expenditure have already been deflated by price and thus better reflect the increases in the amount of goods and services that the government actually purchases. Graph 5.1 shows the total government expenditure in both term of nominal and real terms.



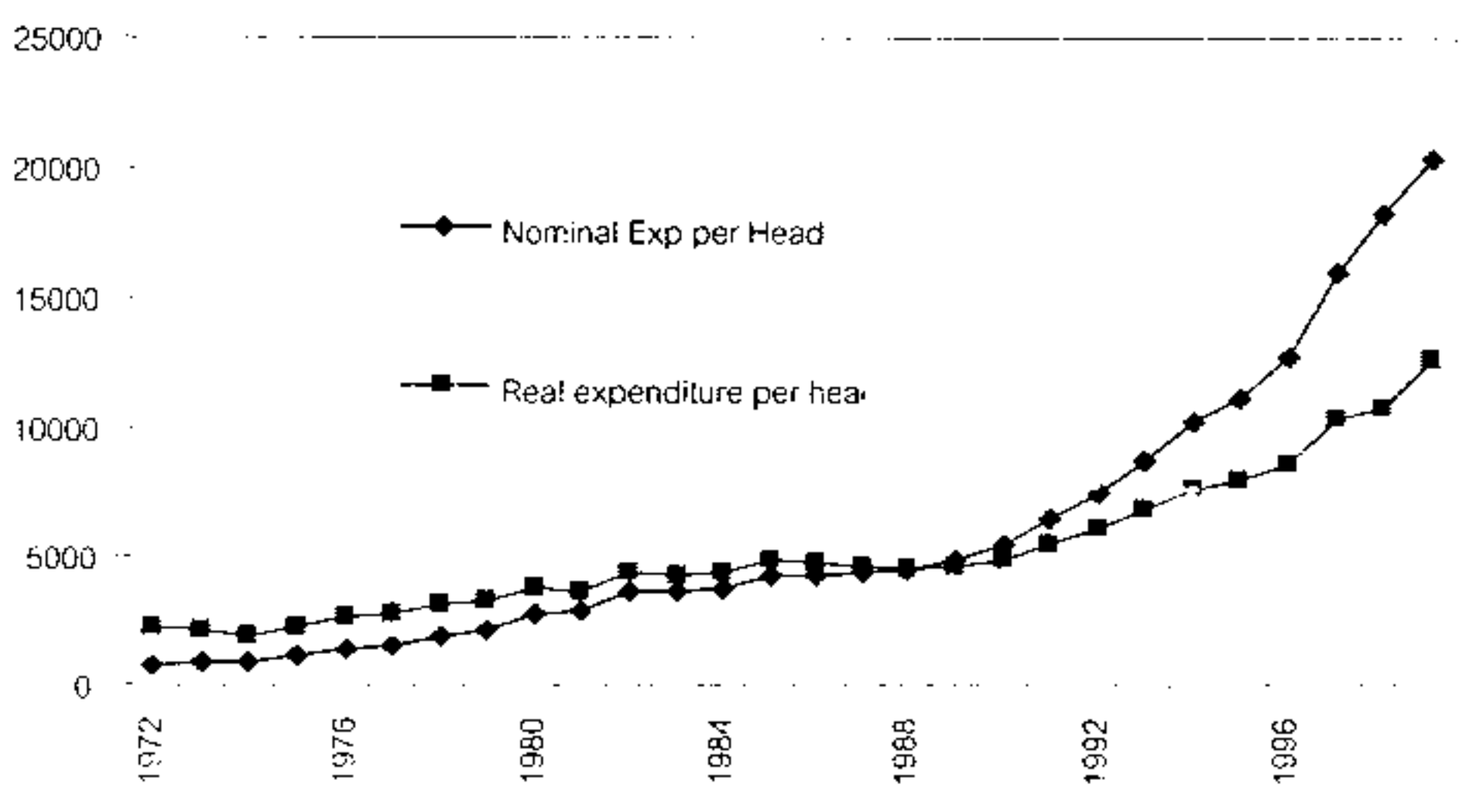
Graph 5.1 The Nominal and Real Government Expenditure

It may be seen that even in real terms the government expenditure has been increasing over times. This implies that the amount of goods and services bought by the government has indeed increased overtime. This, however, does not mean that the government has increased its role in the economy since the economy has also been growing along the period of study. The relative role of the government thus has to be investigated in the context of the national income being generated—the GDP. This will be discussed in the following sub-section.

In terms of expenditure per capita or the amount of expenditure the government paid per head is displayed in the graph 5.2 and in table 5.3.

Table 5.3 Expenditure per Head: Real and Nominal (Unit: Baht per head)

	Expenditure Per Head	
Year	nominal term	Real Expenditure Per Head
1972-1976	982	2240
1977-1981	1130	2336
1982-1986	1323	2515
1987-1991	1574	2803
1992-1996	1908	3119
1997-1999	2213	3321

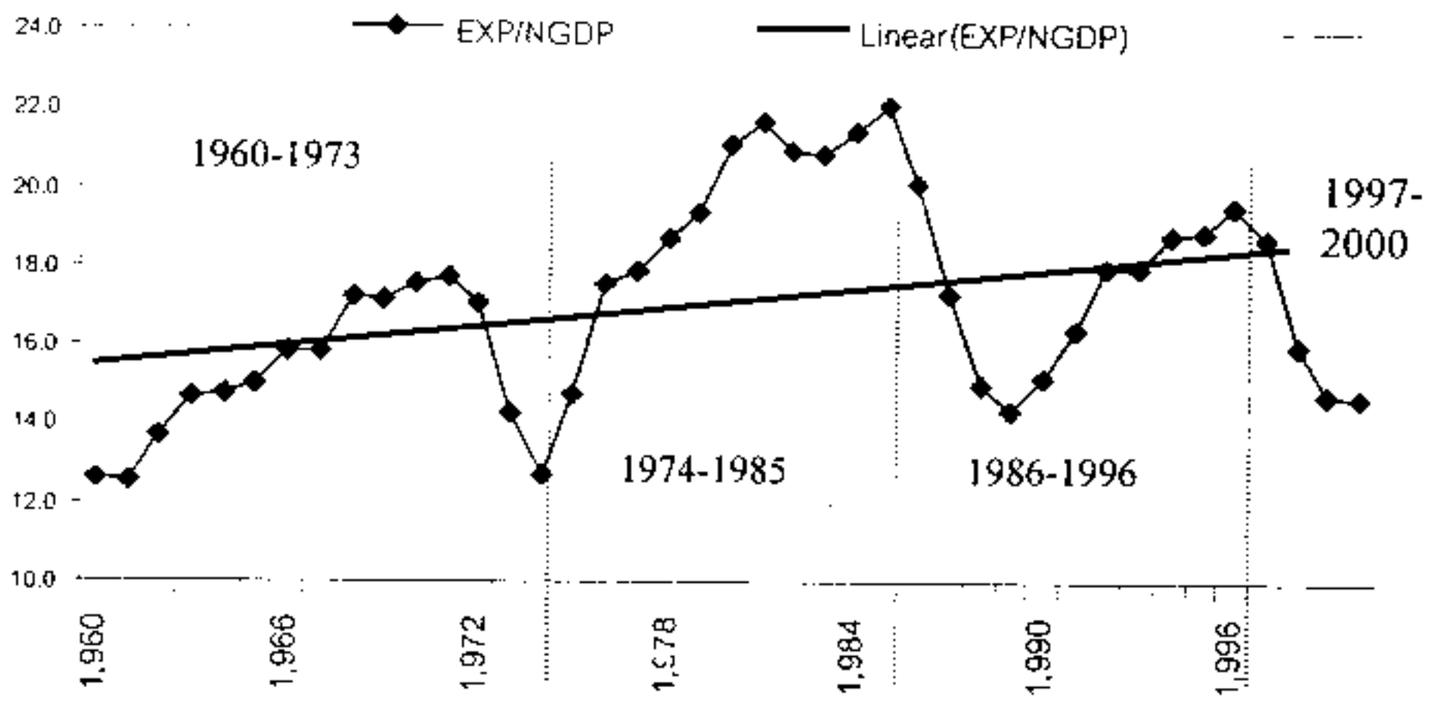


Graph 5.2 The government expenditure per head in real and nominal term (Unit : bath)

It can be seen that the government expenditure increased over time whether judging from the nominal and real terms. In nominal terms, it increased from 982 baht per head during 1972 to 1976 to 2213 baht per head during 1997 to 1999 or up around 2.5 folds during last 20 years. After adjusting for price effects, in real terms the government expenditure also increased over time but at slower rate. It should be noted that up to 1986, the government expenditures per head both in real and nominal terms seem stagnant. Only a moderate increase can be observed in the nominal terms probably in response to price changes. The seemingly stable government expenditure during these years is probable due to the stagnant economy in line with the oil shocks and economic crises in the 1970s as well as in the first half of 1980s. In addition, in the first half of 1980s Thailand has experienced a fairy stable political condition under the leadership of Prime Minister Prem. During this period, the economic advisors as well as the Finance Ministers tended to come from a technocrat background. The fiscal policies of this period therefore tended to be conservative (similar arguments were also proposed by Rangsan Tanaponpun, 1991).

5.4 The Expenditure and Growth

To be able to reflect whether the role of the government expenditure have in fact increased over time as suggested by Wagner, in this subsection the path of the government expenditure relative to GDP is further investigated over times. The interaction between the government expenditure and growth will be come clearer if the path is investigated of data over a longer period. Previously, due to the availability of the GFS basis data being limited to post 1972 period, in this sub-section therefore given the more aggregate nature of the analysis the government sector in the national account can be used with availability dating as far back as 1960. The key difference between the national account and the GFS is that the national account uses an accrual basis whereas the GFS emphasis a cash basis. Since this is an ex post analysis, using either one of them will not make any difference to the representation of the government expenditure developments.



Graph 5.3 The Government Expenditure to GDP

The trend and developments in the government expenditure over the past 40 years can be viewed in the graph 5.3. The trend line indicates that on average the government expenditure relative to GDP follows a moderate upward trend which can be interpreted as the roles of government in the economy have gradually increased from 12.6 percent of GDP in 1960 to 15.6 percent of GDP around the year 2000, in line with the Wagner Law. During this period, however, there have been an number of fluctuations depending on the economic cycle. In particular, the period of analysis may be divided into five sub-periods, i.e. during 1960s, 1974-1985, from 1986 to 1996 and finally 1997 to 2000. From this graph, it may be detected that in times of economic difficulties the government tended to increase its role in economy and withdraw at the times of prosperity. In addition, political factors naturally play an important role in determining the government expenditure. The specific development in each of these sub-period are described in more details below

5.4.1 The Period of 1960s: the introduction of national development plan

During the 1960s, the government expenditure to GDP increased steadily though still moderately due to the early stage of the introduction of the first economic development plan. According to this plan, the government was given a larger role in economic and social development as partly guided by the World Bank. In this connection the World Bank lent money to Thailand to finance its infrastructure development. With more foreign financed expenditure through the World Bank as well as a clearer direction of government policy guided by the first economic

development plan, the roles of government rose from 12.8 percent of GDP in 1960 to 17.6 percent of GDP in 1970. These expansions were fostered by favorable external environment in this period, as well as the domestic political stability under a military government, boosting the average growth rate to 8 percent per annum during this period. Although the government had to spend a significant amount of resources on infrastructure and national modernization programs, the favorable economic growth helped to support good revenue collection and limit the government deficit to around 2 percent to GDP.

5.4.2 The Period of 1974-1985:The economic difficulties

In this period, Thailand had to face various economic difficulties particularly from external factors. By the second half of 1970s, the country was plagued with high current deficits as well as accelerated inflation. The current account deficit increased to 5.4 percent of GDP and inflation skyrocketed to over10 percent. The accelerating inflation was associated with the rises in all the prices of agricultural products, exports, oil imports as well as electricity. The oil crisis, in particular, led the oil import prices hikes to more than 150 percent during the last two years of the decade.

The external disturbance in 1970s remarkably weakened the external accounts. The total stock of external debt, for example, amounted to US$ 8.5 billion or around 26 percent of GDP in 1980 and debt services (principal +interest) reached 16.7 percent of exports of goods and services. (Pisit Leeahtam, 1991). The fiscal deficit consequently rose to an unprecedented level of 4.5 percent of GDP.

At the beginning of the 1980s, Thailand was not only sad led with severe economic imbalances similar to most developing countries but also subjected to further shocks from outside the country. These external disturbances include: the world oil price increases, the volatile interest rate and the decline in the major export commodity prices. These caused the government to suffer from huge shortfalls in revenue collection, widening the fiscal deficits through the first half of the decade while the expenditures could not be cut down in line with the shortfalls in revenue given the depressed economic conditions. These factors contributed to a larger proportion of the government expenditure to GDP during this period.

5.4.3 The period from 1986-to 1996:The prosperous economic prosperity and fiscal surplus

This is the period of the consecutive fiscal surpluses linked to the high economic growth. The government therefore moderated its role in the economy. The government expenditure relative to GDP declined from 22.1 percent in 1985 to 19.6 percent in 1996. The lower proportion of the government expenditure in this period was directly attributable to the rapid economic growth. This is in spite of the fact that the government expenditure actually grew by 13.4 percent per annum while the nominal term of GDP grew at an even higher average rate by 14.4 percent per annum during the same period.

5.4.4 The period of 1997 to 2000:The economic and financial crisis

The economic crisis that began in 1997 has practically led the private sector to collapse. The government introduced various measures in responses to the crisis. During the initial phrase from July 1997 to February 1998, the government budget was cut enormously both before and particularly after entering the stand-by credit arrangement program with the IMF. After November 1998, it became widely accepted that the recession was much deeper than anticipated and the government was allowed within the IMF's program parameters to implement fiscal stimulus to boost the economy. The government sector after moderating in the previous period thus began to expand again in the post economic crisis period. The government expenditure planned to pursue this stimulus stance until the time economic rebound is firmly established after which the stance will be shifted back to the traditional conservative fiscal policy as in the past. Accordingly, after the economy recovers, assuming that the current government would still stick to the counter cyclical fiscal policy, (due to the evidence of the past investigated) the role of government can be expected become more moderate.

5.5 The Annual Budgetary Process and the Institutional Aspects of the Government Expenditure Determination

In this part, the author's personal experiences of 8 years in the working group to formulate the annual budget are used as a basis to discuss the qualitative aspects of the annual budget formulation and process to the government expenditure determination.

5.5.1 The Institutional aspects of the annual budget determination

In practice, the annual budget process begins from the working group's proposing a framework for the annual budget. This working group consists of representatives from the four key economic agencies as follows: the Budget Bureau (BB), the Ministry of Finance (MOF), the Bank of Thailand (BOT), and the National Economic and Social Development Board (NESDB). These representatives traditionally play a significant role which have diverse impacts on the government expenditure formulation through a number of interaction as follows:

1. The Budget Bureau is responsible mainly for the setting up of the expenditure sides as well as to ensure that the draft budgetary framework drawn up by the working group is within an acceptable range. Here, rigorous discussion and arguments usually take place within the working group whereby the representatives from the Ministry of Finance, the Bank of Thailand tend to set the budget more conservatively on the lower side compared with the Budget Bureau. In this case, the budget bureau will face the challenges of mediating between technocrats and the political groups to arrive at both a feasible and acceptable number. Here, the budget bureau acts as the front office explaining to the various government agencies why some of their projects have been approved and some are not. A more lenient budget size will make the Budget's Bureau work easier. Conversely in practice, the Budget Bureau also tends to induce the working group towards the higher annual budget.

2. The Ministry of Finance, on the other hand, is responsible for the revenue collection. The MOF representatives include staffs from each of the revenue collecting agencies namely the Revenue Department, the Excise Department and the Custom Department, and the Fiscal Policy Office (FPO). The FPO takes the responsibility of assessing the macro estimate of revenue collection as well as the

macro budgetary framework. Normally, the FPO representative also acts as the secretary of the working group therefore and is thus responsible for explaining and preparing proposals to be submitted to the Minister of Finance. For check and balance, the revenue collecting agencies and the FPO will do the revenue forecast separately on their own. A controversy may arise at this part because the FPO does not have to be accountable if the actual revenue collection falls below the projection. The revenue collecting agencies, however have direct accountability and consequently tend to be more conservative. In this regard, the revenue collecting agencies tend to estimate the revenue collection on the low side whereas the FPO may tend to be more impassively 'neutral'. It should be noted here that the word "neutral" does not mean to be more precise, but rather judge the current economic conditions objectively at the time of estimation. In this regard, the FPO estimate seems to be more consistent. In the case that representatives cannot agree among themselves within the working group the revenue collecting agencies will have to adopt the estimate of the FPO pending endorsements from the other representatives. The revenue collecting agencies, however, will reserve their rights to veto in the final conference which will be chaired by the Minister of Finance.

3. The Bank of Thailand (BOT) has the responsibility for assessing the economic and monetary conditions. These include assessing the conditions of the public sector as a whole and in particular giving comments on the suitable size of the expenditure and revenue as well as the budget deficit and the available financing channels. In practice, the Bank of Thailand prepares its own estimate of revenue collection, the expected budget size, and the preliminary impacts of such a budget on the economy. In particular, given the scenario of the budget size and deficit, BOT's inputs to the working group will usually include an estimate of the economy will expand. In addition, because the Bank of Thailand have no vested interest in the size of the budget and revenue collection, this presumably more objective scenario will provide a check and balance for the other agencies. Nevertheless, the Bank of Thailand also has its own agenda in setting up the government expenditure program. The main duty of the Bank of Thailand is to contain inflation. In this regard, the representatives from the Bank of Thailand also tend to push for a lower budget deficit. This deficit plays a critical role in the inflation process because the government sector

will have a direct impact on the economy through its net injection of the government expenditure minus the government revenue. While the Bank of Thailand has no explicit interest in the setting government expenditure and revenue size, its prominent objectives of containing inflation and minimizing the budge deficit will tend to induce its representatives to prefer a lower expenditure size (against the Budget Bureau) or tend to underestimate revenue collection and favor the revenue generating measures attached to the annual budget proposal. In this regard the Bank of Thailand may tend to be biased towards both a lower growth and smaller government expenditure scenario.

4. The National Economic and Social Development Board (NESDB) is designated the official forecaster of the economic variables to be used in the revenue estimation. In practice, the NESDB similar to the Bank of Thailand and the Fiscal Policy Office will rely on economic assumptions to estimate revenue whereas the revenue collecting agencies tend to use their own experiences from the close contact with other taxpayers as well as the tax collection information to estimate the revenue.

The establishment of this working group owes a great deal to the original Balloon Theory of Dr. Puay Ungpakorn--former the secretary general of the Budget Bureau as well as the governor of the Bank of Thailand. The balloon theory focuses on the coordination of the fiscal policy, monetary policy and the external sector development. Screening the annual budget through this working group will ensure the compatibility of the fiscal policy, monetary policy as well as the foreign exchange policy. In addition, the internal check and balance inherent in this budgetary framework highlighted by the working group is probably an optimal way of escaping possible biases that may arise from any particular agencies (see Diagram 5.1 The institutional aspects of government expenditure determination).

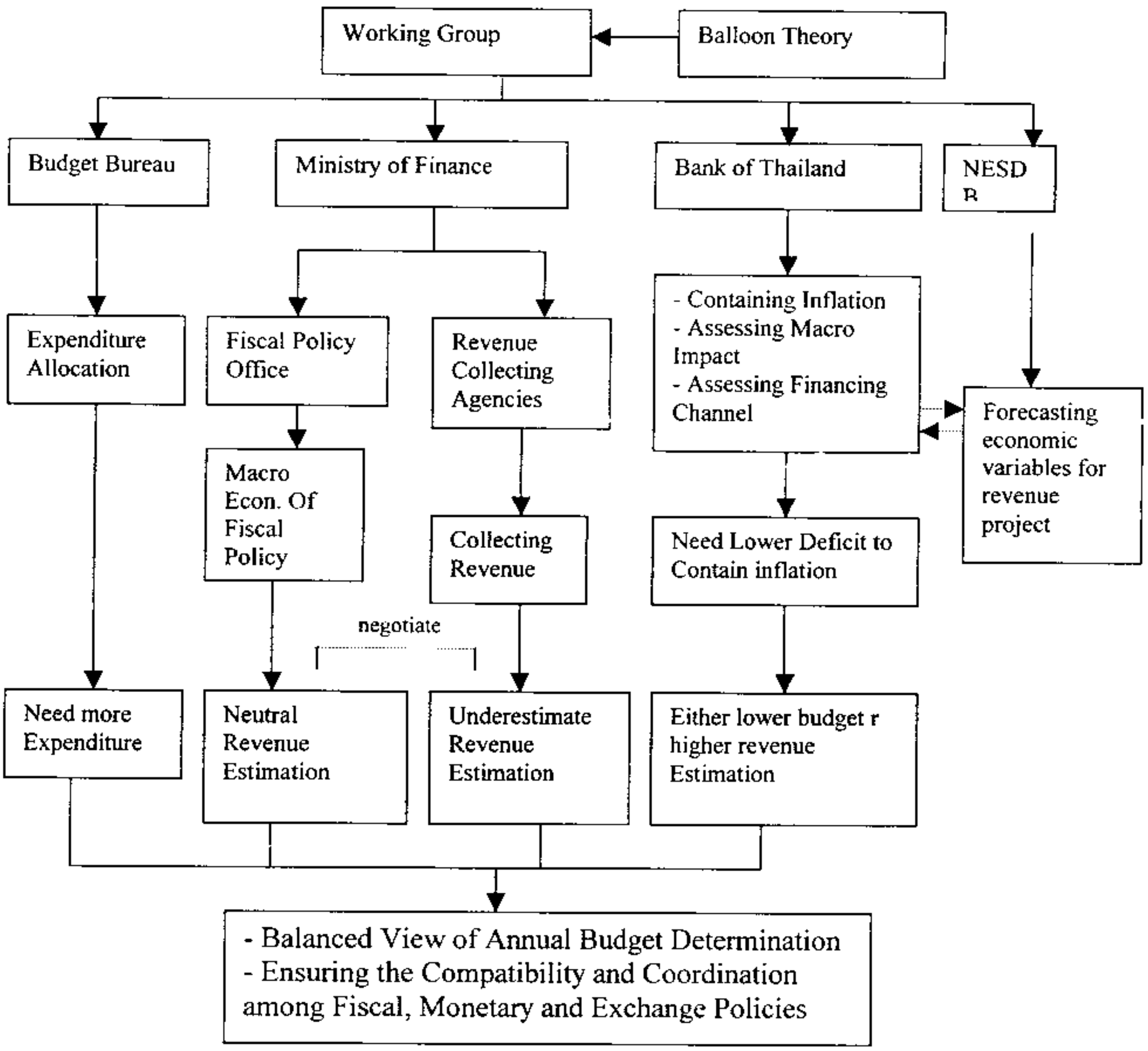


Diagram 5.1 Institutional Aspects of the Annual Budget determinant

5.5.2 The Annual Budget determination Process

After the working group considering of the 4 economic agencies has come up with the budget framework, which includes the amount of expenditure, revenue collection, deficit, financing channels as well as the preliminary impacts to the economy, the proposal will be submitted to the Minister of Finance and to the cabinet for approval. After the cabinet agrees with the framework, the Budget Bureau will compile all the requests from all government agencies and allocate the budget to each agency within the approved framework and draft the Annual Budget Law to be resubmitted to the cabinet for approval. If the cabinet approves, the annual budget

law will then be submitted to parliament. Having gone through both house of representative and the senate, the draft will become the Annual Budget Act B.E (the budget year) and used as the basis for disbursing the expenditure for that year. The process of the annual budget is shown in diagram 5.2.

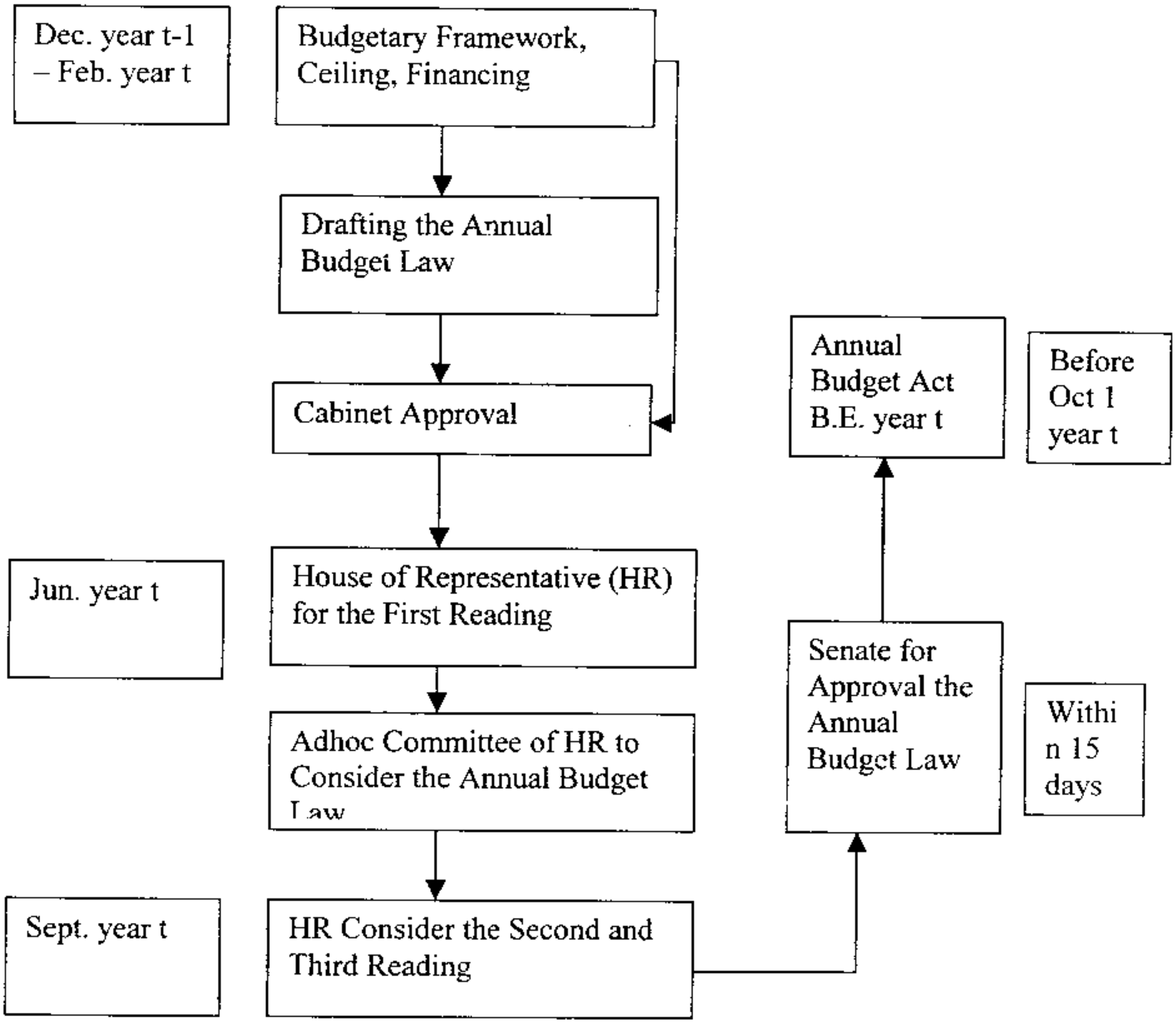


Diagram 5.2: Budgetary Process of the Annual Budget

5.5.3 The Macroeconomic process of the government expenditure determination

In this subsection, the macro economic process is discussed along with the macroeconomic factors considered in the annual government expenditure determination (see diagram 5.3). The macro economic process concerns mainly with the steps in determining the optimum government expenditure taking into account the relevant variables including the economic growth, the ability to collect revenue, the

size of the deficit, the impact on the money market and the crowding out effect, as well as the impact on the public debt and long term debt sustainability.

The process begins by first intuitively setting the expenditure size. The intuitive government expenditure will provide an input into the macro econometric model. Given an appropriate set of assumptions the model will be able to estimate how much the economy will grow in response to this size of expenditure. As the government revenue will also expand along with the economic growth, the final equilibrium estimate of the government revenue can be obtained. Based on this revenue projection, the government budget deficit or surplus can also be estimated. The level of deficit or surplus can be investigated for its optimality normatively. To judge its optimum level, a fiscal impulse analysis will be conducted, to graph whether the emerging economic growth is closed to its potential level. If the optimum budget is a deficit, then three further questions can be raised: first whether such an amount of deficit will crowd out the money market (the more deficit needs more credit and hence lowers credit availability to private sector known as the crowding out effect); and second what sources of financing should government borrow; and lastly how the additional debt from deficit will affect the long term debt sustainability. Suppose such a level of deficit is unacceptable, then two options are available: reducing the expenditure or raising the revenue through additional tax measures. Once decided, these adjustments will have to be taken into consideration for its overall impacts on the economy again as shown in Diagram 5.3.

In short, macroeconomic factors can affect the size of the government expenditure. A low and depressed economic growth naturally calls for a larger amount of government expenditure and hence more budget deficit. The larger government expenditure during depressed time is empirically evident (in graph 5.3 investigated in the previous sub section). Such an increase in the expenditure is partly a result of these macroeconomic considerations.

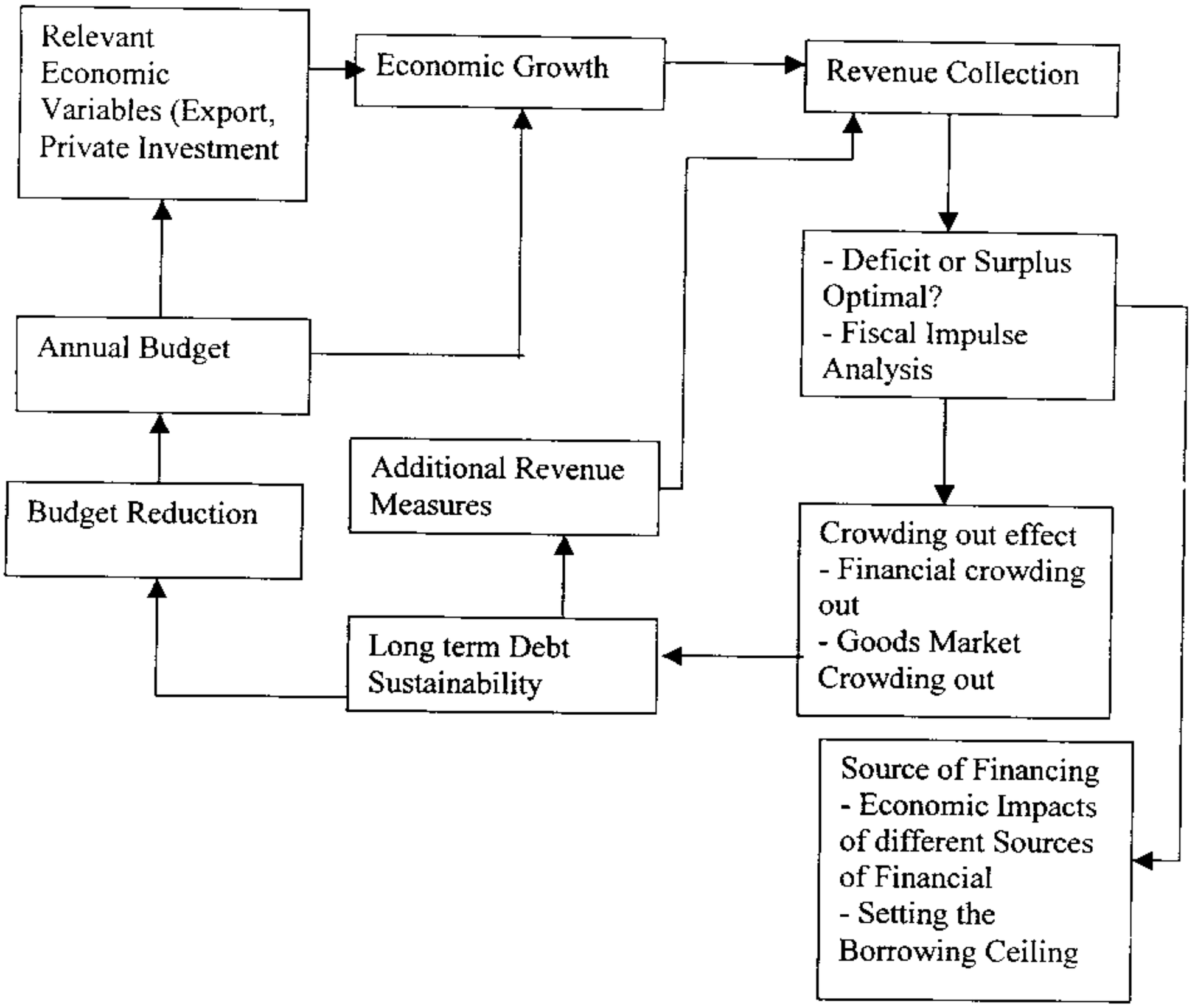


Diagram 5.3 Macro Economic Process of Fiscal Policy

CHAPTER 6

CONCLUSION

In this study, attempts are made to gain insights into the behaviors of the government expenditure policy focusing on how it is formulated and what are its determinants. In the literatures thus far, a study of this kind is relatively scarce. Most of the previous studies are cross section analysis as against the time series analysis of the present study in the case of Thailand. The data dating back to 1960 is applied to determine factors that statistically affect the government expenditure policy, as well as its development. This study is aimed to be an explanatory research, viewing the government expenditure policy as the dependent variable while the analysis seeks to explain the behavioral pattern by referring to the independent variables—social, economic, demographic, political. This study therefore tries to answer the following research questions:

1. What is the pattern of government expenditure; how it has evolved in relation to the historical events of the period, does and how its allocation changed over time?

2. What factors cause the government expenditure and its allocation to change, and do the proposed socio-economic and demographic variables explain it? From reviewing the relevant literatures, a number of theories and hypotheses have been chosen to test for their plausibility explaining the Thai government expenditure.

Given the scarcity of the empirical literature particularly on time series analysis, the present thesis relies substantially on the study by Peacock and Wiseman (1967), which was applied to the data in the United Kingdom. The framework, nevertheless, has been modified to better-fit Thailand's situation, particularly in terms of perspectives focus, data as well as the methodology itself.

In terms of perspectives already mentioned the nature of this thesis is an explanatory research, which aims to analyze the behavior, pattern, development as well as factors causing the government expenditure in Thailand. Given the analytical framework and objectives, the natural choice of methodology is the time series analysis by which as long as possible data are collected, analyzed, patterned and related to the rationally hypothesized independent variables. These hypothesized independent variables are derived from a combination of the developed model, the previous studies, and hypothesis formulated in this study based on the Thai experiences. It should be noted that research of this kind has never been performed in the case of Thailand's government expenditure. Even in international sphere, since the work of Peacock and Wiseman which was based on study the public expenditure in United Kingdom, this kind of research has been rarely done, particularly one that is based on a time series analysis of government expenditure in a specific country.

Second, the choice of the independent variables used in explaining the pattern of government expenditure is also different from the literature. In the cross-country study, the variations in the social, political and demographic variables are easily to be observed and tested empirically. For a time series analysis like the present study, however, these variables tend to depict little movements in the short run, but exhibit some changes in the longer term. The variables that were found significant in the cross-country study may thus not be applicable to the case of time series analysis. The choice of independent variables thus has to be refined to fit the time series nature.

Third, although some frameworks and tools in this study are derived from the economic field, the core of this thesis is a policy based-analysis. This approach is based on the belief that any endeavor to apply the more advanced quantitative tools of other fields (such as economics) to policy analysis field would be more or less beneficial in advancing the body of knowledge in this field further.

In order to answer the research question set out above, the theoretical framework chosen is based on the economic welfare function by which the government is assumed to select its economic policy so as to maximize its own welfare, subjecting to constraints. Based on a welfare function, nine equations were proposed. After discussing all the possible conditions (e.g. demographic etc.) variables, those that are deemed appropriate and theoretically sound are added in

those nine equations to arrive at the final forms ready to be estimated empirically. These equations divide government total expenditure into the following sub-categories: 1) capital expenditure 2) current expenditure 3) total expenditure (itself) 4) economic affairs expenditure 5) education expenditure 6) health expenditure 7) social and welfare expenditure 8) goods and services expenditure and 9) wage and salary expenditure. These equations were extended further to include the incrementalist variables. The conditions variables used in this study include, the Degree of openness and Current account balance, Value added of agriculture (relative to GDP), Dependency ratio, Ratio of people aged less than 15and Ratio of people aged more than 60, Population change and urbanization, Value added of manufacturing sector , Growth of per capita income, and Dummy variable.

The final nine equations, with appropriately assigned conditions variables and incremeiitalist variable, were regressed using the OLS techniques. Given the study being based on time series analysis, the problem of the autocorrelation was specially taken care of to make sure that the estimated coeeficients as well as their standard errors are valid. Due to the used of lag dependent variables as the incrementalist variables, the traditional Durbin Watson statistic is inadequate in monitoring the problem of autocorrelation. The Q statistic, which is more general and reliable in measuring the autocorrelation, is employed in all estimated equations. In some cases, a number of conditions variables have been dropped from the original equations when they are found insignificant or having high correlations with other independent variables. A particular conditions variable that is found insignificant and subsequently dropped from the equations is for example the value added of agriculture.

The overall results of the estimation could be summarized as follows:

1. The nine proposed equations can fit and explain the behavior of the government expenditure allocation reasonably well. All of these equation have F statistics which are statistically significant and have the R^2 of more than 90 percent implying good explanatory powers of the equations.

2. The total expenditure after interest payment (TE-INT)/GDP, and in particular the incrementalist variables have shown significant roles in determining all types of expenditures in all equations. The size of the government expenditure in the

economy and the base of last year's expenditure appear to have been used by policy makers in allocating government expenditure. In addition the incrementalist variable or the last year's base effect have influenced the allocation of current expenditure relatively more than capital expenditure. This perhaps implies the lower degree of flexibility of the current expenditure. This kind of characteristic was also found in the sub-categories of the of current based expenditure in particular the wage and salary expenditure. The influence of the incrementalist variable is the least in the government capital expenditure implying probably the most flexibility in adjusting this kind of government expenditure in response to external shocks. When the economy was in difficulties, the government therefore tended to select to adjust down the capital expenditure sharply. This is partly because the capital expenditure occupies only a small proportion of the budget, given the amount of expenditure being cut down, the government often has to cut capital expenditure snarply to effect a significant proportion relative to the budget. Finally, unless the economic prosperity makes the government revenue to recover and provide an additional room for capital expenditure, the capital items will normally go down particularly at the time of a depressed economy. This behavior is pro cyclical and can be detrimental to sustained economic development.

3. The demographic variables are also found to have statistical influences on the government expenditure. Different demographic variables, however, have different impacts on different types of expenditures. Among others, the value added of the manufacturing sector has played an important role in determining the capital expenditure and the expenditure for economic affairs. Dependency ratio, on the other hand, also has statistically affected the expenditure for social and welfare, reflecting probably the subsidy-based expenditure for the poor and the less privileged persons. As expected, the ratio of the young people influences the share of expenditure for education while ratio of the old affects the expenditure for health. The factors relating to external factors include the degree of openness and the current account deficit, however, are not found to have statistical impacts on the government expenditure allocation as found in other studies. Deeper investigations of the data as well as the legal frameworks of the government supported confirm these insignificant results of the external variable factors. There are evidences, for example, that the governments

have never borrowed from abroad to finance their budget deficits, and the external borrowings under the existing law are limited including the government to use it with great cautions. Unlike other countries, the roles of government to borrow on behalf of the private sector, e.g. to reduce the private external exposure are very scarce in Thailand. These factors together reduce the influences of external variables on government expenditure.

4. The size of the interest payment is found with negative relationship to the government expenditure. This result was deeper investigated further and after looking into the historical implementation of the government, three factors were found supporting the result: first the conservatism of the Thai fiscal policy in the past; second the elasticity of the Thai fiscal policy adjustment; and third the ability to adjust non-interest expenditures in times of hiking interest payments.

With the limitations as well as the inflexibility of the results from the regression analysis, further investigations on the impacts of a number of factors are conducted to complement the regression results. This was achieved in four steps.

In the first step, the statistical causality tests were conducted on the estimated equations. The analysis confirmed the causality relationship with the important independent factors including the incrementalist variable. In particular the expenditure after interest payment as well as the value added in the manufacturing sector and dependency ratio are found to be the major causes of the government expenditure determination.

In the second step, the causality direction is tested between the government revenue and government expenditure. In terms of the government expenditure and revenue relative to GDP, a two ways relationship is found whereas in the absolute terms, the government expenditure appears to have caused the government revenue movements in a one-way direction.

In the third step, the relationships of economic growth as well as economic development and the expenditure policy is investigated. In this step, when the data period is extended back to 1960, it is found that the government has increased its expenditure over time both nominal and real terms. In terms of the expenditure per head, it is also found that the government expenditure has risen by 2.5 folds since 1972. These findings, nevertheless, do not yet mean that the government has

increased its role in the economy. In this regard, the government expenditure relative to GDP is analyzed again over the period extended far back to 1960. From the investigation of the data of approximately 40 years divided into 4 sub-periods as follows: the 1960-1973 reflects the initial period of National and Economic Development Planning; the 1974-1985 represents a period of the economic difficulties; the 1986-1996 depicts a period of economic boom; and last the period since 1997 to illustrate adjustments under the economic and financial crisis. The overall finding is that the government expenditure policies tend to be counter-cyclical, increasing its role in times of economic difficulties and becoming more moderate in the boom period. These behaviors reflect the flexibility in the policy adjustments of the government, as discussed in the fifth chapter.

In the final step, the institutional aspects of the government expenditure are discussed to elaborate on the policy determination process. The actual annual budgetary processes as well as the influences of relevant government agencies in the budgetary process are also analyzed. These qualitative investigations are designed to overcome the limitation as well as complement the quantitative analysis conducted earlier. From the institutional discussions, the roles of the four economic agencies (The Budget Bureau, MOF, BOT and, NESDB) become prominent in determining the government expenditure policy. While each agency may be preoccupied with its own agenda, the four agencies combined provide a check and balance mechanism that is more likely to lead to an optimal fiscal policy. The parliament and the senate provide a further check and balance against the political forces represented by the cabinet.

At the macro level, moreover, the key variables of growth, revenue, expenditure and deficit interact in an intricate fashion through various mechanisms including the crowding out effect. These interactions need to be analyzed in a sophisticated modeling framework to gain accurate projections on key issues such as debt sustainability.

6.1 Theoretical Contributions

(1) Although this study is policy oriented, focusing on the policy determinant analysis, to gain insight into the behavior of the Thai government expenditure determination, there are some theoretical contributions. First, the results confirm that

the government expenditure policy is not exogenously determined, but rather guided by self-interest and the government's perception of the economic situation at the time. These findings also highlight the idea of Dye that policy is not randomly determined but a part of the process in the social and economic development. This will contribute to the future researches whereby more sophisticated models can be conducted to explain other government policies.

(2) The influences of the incrementalist variable are also confirmed and perhaps point to the theoretical significance of this variable for future study to take into account. This variable is obviously important for the model to explain the behavior of the government expenditure adequately.

(3) The findings which are different from the previous cross sectional studies highlight the importance and some advantage of the time series analysis in order to gain insights into a specific country. To rely on the cross sectional results alone for specific country's policy analysis may run the risk of over extrapolation or even misrepresentation.

6.2 Policy Implications

6.2.1 Increase the flexibility in the current expenditure adjustment and reduce the role of the incrementalist

As the empirical results seem to highlight that the government expenditure tends to depend critically on the incrementalist idea which links the current expenditure to the base of last year's expenditure with marginal adjustments. In addition, the results also emphasize the role of the incrementalist variable in the current expenditure rather than the capital expenditure. These together imply that the adjustment in current expenditure assumes a very low policy priority. The rigid current expenditure policies will likely lead to a higher proportion of the current expenditure in the total expenditure. This situation may exacerbated when the economy slow down and the revenue collection falls short of projection. In this circumstance, the capital expenditure will bear the blunt of adjustments. These meager investments in turn, will retard the ability of the country to maintain its medium and long term economic expansion especially when unfavorable economic conditions demand that the government take a lead in accumulating the capital stock

to build up medium term growth potential. The incrementalist tradition for setting the current expenditure perhaps needs to be replaced by a new concept of a more performance- based budgeting. The roles of the government agencies then have to be transformed and reprioritized to trim down the redundant agencies. The role of the government, for example, may be shifted from controllers to supervisors. This will decrease the number of civil servants, which is the main source of the incremental budget currently. In addition, the past tendency to set up new agencies, increase civil servant as well as expand commitment to existing programs are some of the main sources of establishing the incremental budget system. These require conscious and explicit policy to counter them. The government's agencies respomible for the budget process should also look into the contingent impacts of each budget that may occur in the future. These kinds of information should be attached to the budgetary proposal submitted to the cabinet perhaps as a precondition before the project gets approval.

6.2.2 Setting a framework for the global and medium term budget management

Today's budget system reviewed in chapter six is focused only on the central government framed year by year. It may nevertheless be more efficient if the system of the budget were to be changed to the medium term horizon. A medium term budget will help the policy makers to decide on the current year budget while taking full account of all the medium term future burden and liability. This should increase the flexibility of the government expenditure policy without relying excessively on the last year's budget. As for the scope of the budget, it should be allowed to cover the off balance sheet items, local government as well as state enterprises currently not in the budget. The off balance sheet items should be given the first priority for the government to consolidate into the budget system. It should be noted that under the current budget system whether expenditure will appear on or off the budget, the repayment burden eventually belongs to the government and thus should be set in the budget. As a result, by consolidating these items into the budget system, it will alert the government to the entire burden that may arise in the future. This will serve as an early warning system for the government.

For the local government, despite its less significant role in today's budgetary system, the new decentralization law requires that the central government has to set aside a specific amount or let the local government share the central government's revenue up to 35 percent of the central government revenue within 2006. The local government will thus have more roles in the future fiscal policy. The budget system therefore should be prepare to take local government into account fully for effective management now and the future

As for the state enterprises under the current system the capital budgetary framework of the state enterprises have to be screened by the NESDB before being approved by the cabinet. Nervertheless, the timing of the state enterprises budget and the government budget are not synchronized making the policy decisions more difficult in absence of a consolidated public sector data (central government local government and state enterprises).

6.2.3 Increasing the roles of the NESDB in monitoring the annual budget

Despite having one staff representation in the working group on the annual budget framework, the NESDB still plays a limited role in supplying macroeconomic data to the working group. It is crucial that the annual budget be in line with the National Economic and Social development Plan. As discussed in the sixth chapter, no agency is indeed responsible for this monitoring yet. Since NESDB is the plan author, it should be assigned this responsibility.

6.2.4 Concerns on the public debt issue

The issue of public debt substantially has been frequently mentioned after the financial crisis since the government has to pay for the cost of financial restructuring and increase the public debt to 57 percent of GDP at 2001-year end. As the historical analysis of this study indicates given the traditional conservatism of the Thai fiscal policy; the elasticity of the Thai fiscal adjustment, and the current ability to adjust the non-interest expenditure in the time of hiking interest payment, the fiscal policy framework should be equipped to handle the past crisis trauma and keep public debt sustainable. It should be noted, however, cautions still need to be exercised to keep up with the past fiscal policy in containing the public debt particularly in case of further shocks or slowdown in the world economy.

6.3 Suggestions for Further Studies

In this section, some suggestions for future studies are discussed. In particularly the future research in Thai fiscal policy may focus on a broader picture of the fiscal sector. As the year 2006 approaches, the role of the local government (by law) will be come more significant of at least 35 percent of the central government. The ability to adjust to these new resources and responsibility of the local government is also crucial for sustained development of the Thai economy over the medium term.

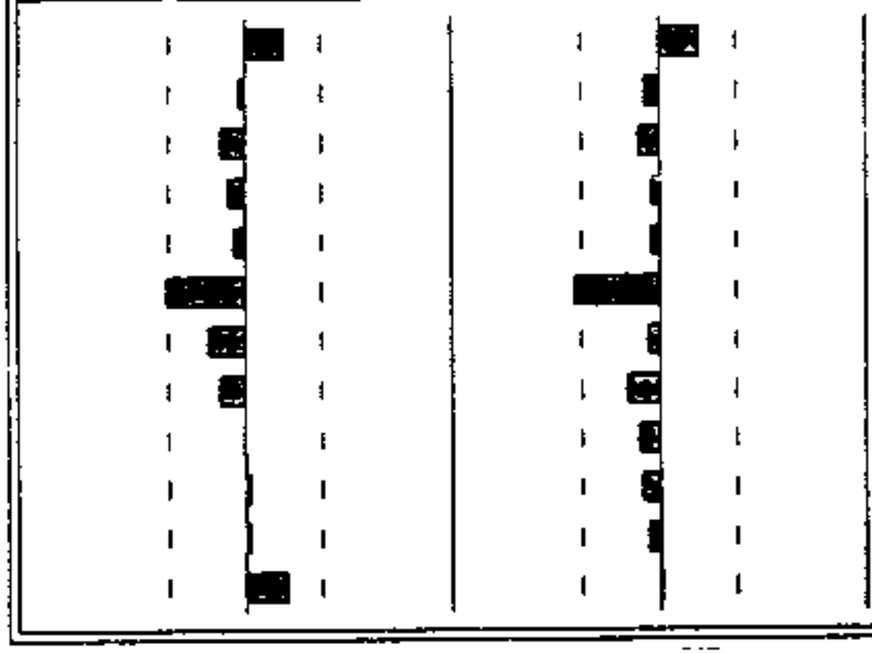
In the context of the central government policy, the issues on tax reform are also worth studying. In line with the increased public debt, the government may tackle the increased debt burden by adjustments on either the expenditure side or revenue side. The ability to adjust the expenditure side has been confirmed in this study, but the revenue side adjustments of the government deserve further in depth studies. The preliminary results found in this study that the revenue collection capabilities of the government seem to be stagnant around 16 to 18 percent of GDP for some time. Given the demand for resources both to meet obligation arising from financial restructuring as well as for development efforts, a study on the capacity building and the channel through which the government can raise its revenue is not only interesting academically but essential from macroeconomic management in Thailand over the medium term.

Appendices

Appendix A: Results of Q-Test

1. Correlogram of Residuals: GCAP/GDP

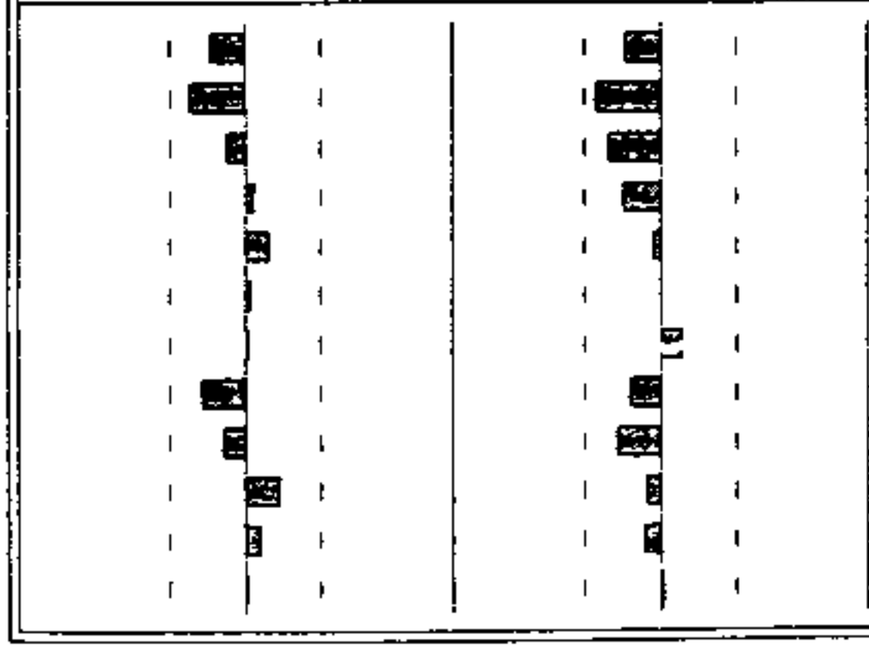
Date: 04/22/02 Time: 13:13
Sample: 1974 1999
Included observations: 26
Q-statistic probabilities adjusted for 1 ARMA term(s)



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.204	0.204	1.2134	
		2	-0.027	-0.072	1.2357	0.266
		3	-0.117	-0.102	1.6717	0.434
		4	-0.080	-0.038	1.8814	0.597
		5	-0.051	-0.038	1.9715	0.741
		6	-0.397	-0.420	7.7089	0.173
		7	-0.181	-0.050	8.9653	0.176
		8	-0.124	-0.163	9.5823	0.214
		9	-0.005	-0.105	9.5834	0.295
		10	0.030	-0.086	9.6257	0.382
		11	0.030	-0.053	9.6694	0.470
		12	0.219	0.014	12.162	0.352

2. Correlogram of Residuals: GCUR/GDP

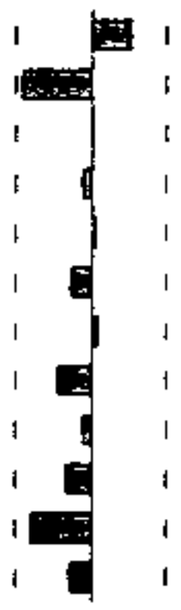
Date: 04/22/02 Time: 13:15
Sample: 1973 1999
Included observations: 27



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.180	-0.180	0.9706	0.325
		2	-0.285	-0.327	3.5073	0.173
		3	-0.098	-0.259	3.8178	0.282
		4	0.042	-0.183	3.8771	0.423
		5	0.127	-0.034	4.4468	0.487
		6	0.029	0.002	4.4774	0.612
		7	0.022	0.101	4.4963	0.721
		8	-0.216	-0.152	6.4160	0.601
		9	-0.114	-0.220	6.9782	0.639
		10	0.176	-0.072	8.4074	0.589
		11	0.081	-0.076	8.7298	0.647
		12	0.014	0.013	8.7404	0.725

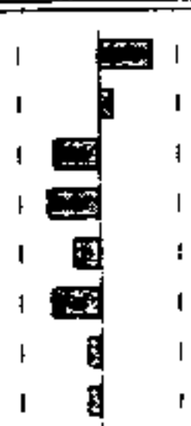
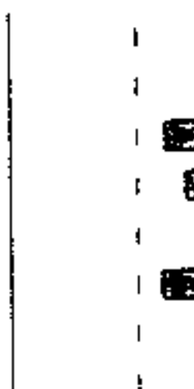
3. Correlogram of Residuals: TE/GDP

Date: 04/22/02 Time: 13:15
Sample: 1973 1999
Included observations: 27

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.198	0.198	1.1765	0.278
		2	-0.293	-0.346	3.8673	0.145
		3	-0.144	0.002	4.5472	0.208
		4	0.024	-0.047	4.5669	0.335
		5	0.060	0.017	4.6945	0.454
		6	-0.065	-0.104	4.8514	0.563
		7	-0.028	0.038	4.8830	0.674
		8	-0.093	-0.169	5.2386	0.732
		9	-0.092	-0.046	5.6038	0.779
		10	-0.059	-0.126	5.7617	0.835
		11	-0.228	-0.306	8.2985	0.686
		12	-0.116	-0.111	9.0009	0.703

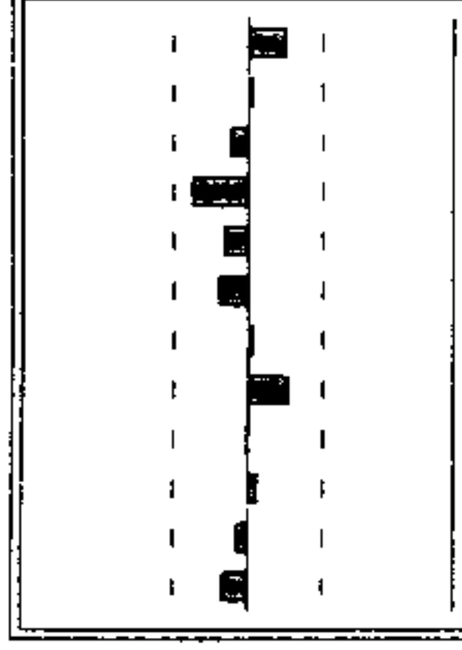
4. Correlogram of Residuals: E_AFFAIR/GDP

Date: 04/22/02 Time: 13:14
Sample: 1975 1999
Included observations: 25
Q-statistic probabilities adjusted for 1 ARMA term(s)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.265	0.265	1.9802	
		2	0.066	-0.005	2.1079	0.147
		3	-0.223	-0.258	3.6365	0.162
		4	-0.255	-0.151	5.7218	0.126
		5	-0.134	-0.007	6.3295	0.176
		6	-0.241	-0.271	8.3968	0.136
		7	-0.063	-0.046	8.5469	0.201
		8	-0.061	-0.092	8.6949	0.275
		9	0.080	-0.023	8.9646	0.345
		10	0.143	0.018	9.8816	0.360
		11	0.061	-0.067	10.063	0.435
		12	-0.015	-0.127	10.075	0.524

5. Correlogram of Residuals: EDUCA/GDP

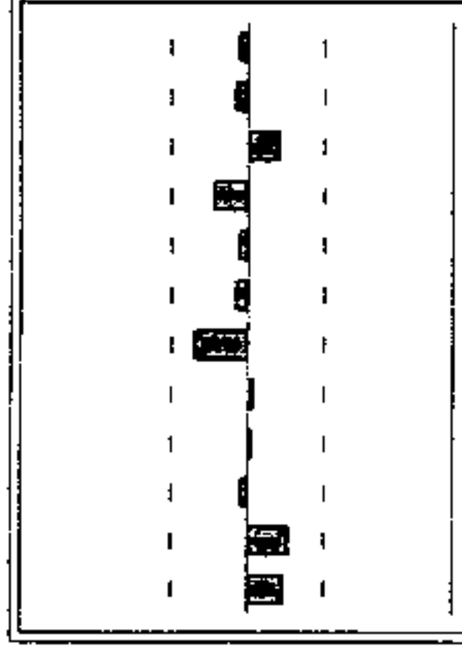
Date: 04/22/02 Time: 13:14
Sample: 1973 1999
Included observations: 27



	Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
1			0.194	0.194	1.1300	0.288
2			0.025	-0.013	1.1503	0.563
3			-0.089	-0.095	1.4074	0.704
4			-0.279	-0.256	4.0628	0.398
5			-0.120	-0.023	4.5748	0.470
6			-0.144	-0.130	5.3501	0.500
7			0.023	0.036	5.3700	0.615
8			0.204	0.135	7.0824	0.528
9			-0.007	-0.127	7.0848	0.628
10			0.045	-0.002	7.1771	0.709
11			-0.055	-0.054	7.3264	0.772
12			-0.125	-0.058	8.1438	0.774

6. Correlogram of Residuals: GOODS_SERV/GDP

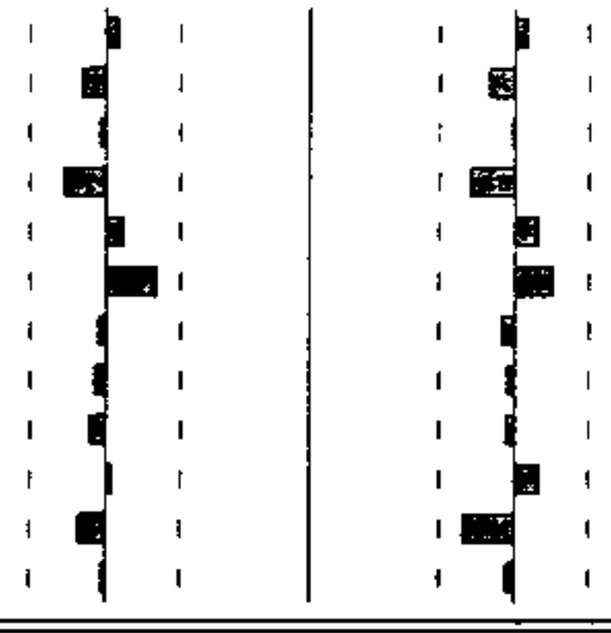
Date: 04/22/02 Time: 13:15
Sample: 1974 1999
Included observations: 26
Q-statistic probabilities adjusted for 1 ARMA term(s)



	Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
1			-0.043	-0.043	0.0532	
2			-0.064	-0.066	0.1776	0.673
3			0.157	0.153	0.9625	0.618
4			-0.171	-0.168	1.9307	0.587
5			-0.049	-0.040	2.0144	0.733
6			-0.061	-0.115	2.1506	0.828
7			-0.271	-0.246	4.9548	0.550
8			0.029	-0.018	4.9887	0.661
9			0.020	-0.013	5.0060	0.757
10			-0.034	0.007	5.0579	0.829
11			0.208	0.134	7.1487	0.711
12			0.187	0.194	8.9662	0.625

7. Correlogram of Residuals: HEALTH/GDP

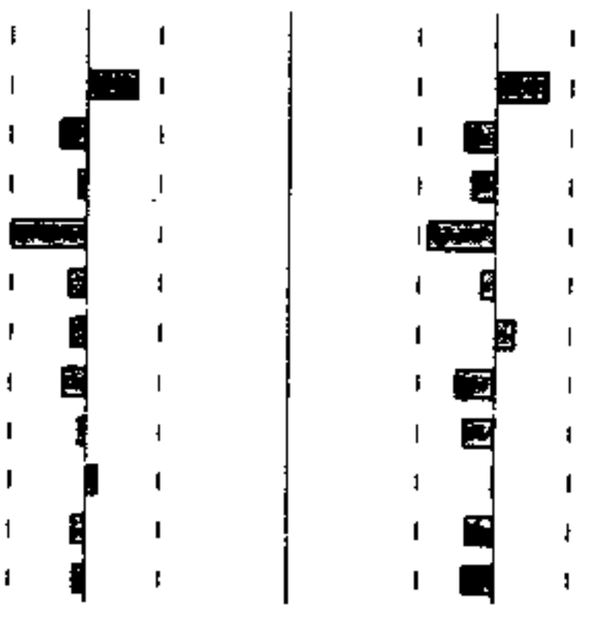
Date: 04/22/02 Time: 13:15
Sample: 1973 1999
Included observations: 27



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.062	0.062	0.1146	0.735
		2	-0.120	-0.125	0.5681	0.753
		3	-0.027	-0.011	0.5923	0.898
		4	-0.210	-0.227	2.0955	0.718
		5	0.089	0.122	2.3796	0.795
		6	0.261	0.202	4.9104	0.555
		7	-0.040	-0.058	4.9741	0.663
		8	-0.053	-0.041	5.0877	0.748
		9	-0.077	-0.044	5.3445	0.803
		10	0.026	0.129	5.3745	0.865
		11	-0.139	-0.261	6.3155	0.852
		12	-0.024	-0.046	6.3449	0.898

8. Correlogram of Residuals: SOCIAL_WELF/GDP

Date: 04/22/02 Time: 13:15
Sample: 1973 1999
Included observations: 27



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.005	0.005	0.0008	0.977
		2	0.259	0.259	2.1069	0.349
		3	-0.139	-0.152	2.7395	0.434
		4	-0.049	-0.120	2.8211	0.588
		5	-0.380	-0.334	7.9682	0.158
		6	-0.087	-0.072	8.2506	0.220
		7	-0.077	0.101	8.4828	0.292
		8	-0.121	-0.196	9.0852	0.335
		9	-0.036	-0.148	9.1406	0.424
		10	0.060	-0.012	9.3047	0.503
		11	-0.058	-0.137	9.4692	0.579
		12	-0.051	-0.148	9.6052	0.651

9. Correlogram of Residuals: WAGE/GDP

Date: 04/22/02 Time: 13:16
Sample: 1973 1999
Included observations: 27

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.070	0.070	0.1456	0.703
		2	-0.114	-0.119	0.5509	0.759
		3	-0.238	-0.225	2.3934	0.495
		4	-0.333	-0.340	6.1615	0.187
		5	-0.152	-0.234	6.9803	0.222
		6	0.120	-0.047	7.5201	0.275
		7	0.087	-0.156	7.8141	0.349
		8	0.055	-0.190	7.9383	0.440
		9	0.121	-0.027	8.5760	0.477
		10	0.016	-0.026	8.5874	0.572
		11	-0.009	-0.007	8.5911	0.660
		12	-0.131	-0.162	9.4820	0.661

Appendix B: List of data

Year	Nominal GDP	Real GDP	GDP per capita	GDP deflator	MANUV	URB
1951	30,567	133,366	1,505.76	0.23	4,215	39.56
1952	32,139	140,754	1,537.75	0.23	4,778	40.73
1953	35,291	156,264	1,641.44	0.23	5,397	41.90
1954	35,137	155,037	1,589.91	0.23	5,490	43.07
1955	42,793	168,589	1,876.89	0.25	6,753	44.43
1956	44,185	171,467	18,802.00	0.26	7,222	45.80
1957	45,324	173,380	1,872.89	0.26	6,990	47.16
1958	47,140	179,648	1,893.17	0.26	7,567	48.53
1959	52,542	201,260	2,052.42	0.26	8,036	49.89
1960	59,077	225,667	2,237.77	0.26	8,549	51.45
1961	64,477	237,420	2,370.48	0.27	9,773	53.01
1962	69,877	255,875	2,495.61	0.27	11,379	54.57
1963	74,537	276,591	2,588.09	0.27	12,208	56.13
1964	81,675	295,466	2,637.32	0.28	13,198	60.35
1965	91,800	318,900	2,867.31	0.29	15,149	62.39
1966	109,396	354,898	3,305.52	0.31	17,593	64.50
1967	117,446	384,551	3,433.66	0.31	21,075	66.66
1968	126,457	416,069	3,577.22	0.30	22,577	68.89
1969	139,129	448,666	3,810.08	0.31	25,474	71.16
1970	148,280	478,041	4,076.53	0.31	23,934	70.89
1971	154,468	501,203	4,121.30	0.31	27,428	73.04
1972	171,461	522,344	4,442.57	0.33	31,886	75.22
1973	224,340	574,414	5,701.84	0.39	43,426	76.68
1974	282,091	600,154	6,989.82	0.47	54,456	78.65
1975	307,366	629,858	7,426.09	0.49	57,675	80.66
1976	349,927	687,608	8,237.10	0.51	69,437	82.79
1977	406,659	755,415	9,335.17	0.54	82,926	84.90
1978	490,983	830,025	11,000.93	0.59	99,450	86.98
1979	562,580	873,508	12,315.69	0.64	119,769	89.02
1980	662,482	913,733	14,180.50	0.73	142,504	91.05
1981	760,356	967,706	15,197.23	0.79	172,143	97.51
1982	841,569	1,019,501	17,266.79	0.83	179,438	94.99
1983	920,989	1,076,432	18,518.61	0.86	203,837	96.92
1984	988,070	1,138,353	19,482.82	0.87	226,360	98.84
1985	1,056,496	1,191,255	20,442.01	0.89	231,598	100.72
1986	1,133,397	1,257,177	21,525.36	0.90	270,605	102.62

Year	Nominal GDP	Real GDP	GDP per capita	GDP deflator	MANUV	URB
1987	1,299,913	1,376,847	24,250.20	0.94	315,291	104.47
1988	1,559,804	1,559,804	28,601.88	1.00	403,034	106.28
1989	1,856,992	1,749,952	33,491.20	1.06	496,714	108.06
1990	2,183,545	1,945,372	38,756.16	1.12	594,003	109.80
1991	2,506,635	211,862	44,307.19	11.83	707,901	110.26
1992	2,830,914	2,282,572	49,410.30	1.24	778,987	111.66
1993	3,170,258	2,473,937	54,650.20	1.28	892,369	113.05
1994	3,630,805	2,695,054	61,839.88	1.35	1,017,062	114.42
1995	4,188,929	2,993,168	70,519.50	1.40	1,180,047	115.76
1996	4,598,288	3,095,041	76,634.30	1.49	1,305,772	116.94
1997	4,740,249	3,074,528	78,219.35	1.54	1,362,681	118.11
1998	4,628,431	2,743,360	75,626.72	1.69	1,362,990	119.27
1999	4,615,388	2,859,159	74,675.40	1.61	1,435,369	120.45

Year	OPEN	CA	AGE15	AGE60	DEPR
1957	38.82	-313			
1958	32.83	-1370			
1959	33.17	-1202			
1960	32.57	-590	43.1	4.6	47.7
1961	33.49	243	43.32	4.63	47.95
1962	32.22	-1203	43.54	4.66	48.2
1963	32.4	-2242	43.77	4.69	48.46
1964	35.78	-1149.3	43.99	4.72	48.71
1965	34.72	-1101.4	44.21	4.75	48.96
1966	35.69	-364.1	44.43	4.78	49.21
1967	38.32	-2404	44.6	4.81	49.41
1968	37.63	-4734	44.77	4.84	49.61
1969	36.16	-5569	44.93	4.87	49.8
1970	35.09	-6601	45.1	4.9	50
1971	35.55	-4561	44.34	4.95	49.29
1972	38.32	-1974	43.59	5	48.59
1973	39.49	-3541	42.83	5.05	47.88
1974	46.46	-5754	42.08	5.1	47.18
1975	42.9	-10732	41.32	5.15	46.47
1976	42.52	-8558	40.57	5.2	45.77
1977	44.98	-21867	40	5.25	45.25
1978	43.75	-20639	39.43	5.3	44.73
1979	51.53	-37590	38.87	5.35	44.22
1980	54.48	-41444	38.3	5.4	43.7
1981	53.97	-47704	37.86	5.46	43.31
1982	47.55	-14412	37.41	5.51	42.93
1983	47.38	-65962	36.97	5.57	42.54
1984	48.07	-42146	36.53	5.63	42.16
1985	49.16	-28822	36.09	5.69	41.77
1986	49.17	23038	35.64	5.74	41.39
1987	57.23	7280	35.2	5.8	41
1988	67.5	-23025	33.75	6.02	39.77
1989	72.45	-48561	32.3	6.24	38.54
1990	75.45	-136724	30.86	6.45	37.31

Year	OPEN	CA	AGE15	AGE60	DEPR
1991	78.47	-163997	29.41	6.67	36.08
1992	77.95	-113511	27.96	6.89	34.85
1993	79.38	-118769	26.51	7.11	33.62
1994	81.97	-159481	25.06	7.32	32.39
1995	89.76	-262269	23.62	7.54	31.16
1996	84.39	-268450	23.34	7.8	31.14
1997	58.51	59674	22.86	8.04	30.9
1998	55.58	446433	22.63	8.31	30.95
1999	61.43	483263	22.5	8.4	30.9
2000					18.82

Year	GCAP	GCAP/GDP	GCUR	GCAP/GDP	TE
1972	8,112	0.05	20,204	0.12	28,316
1973	7,148	0.03	25,528	0.11	32,676
1974	7,188	0.03	27,770	0.10	34,958
1975	9,275	0.03	34,978	0.11	44,253
1976	14,430	0.04	40,824	0.12	55,254
1977	17,001	0.04	47,162	0.12	64,163
1978	20,556	0.04	59,581	0.12	80,137
1979	21,219	0 04	74,637	0.13	95,856
1980	28,866	0.04	95,685	0.14	124,551
1981	32,364	0.04	112,329	0.15	144,693
1982	38,336	0.05	131,449	0.16	169,785
1983	36,035	0.04	144,214	0.16	180,249
1984	33,877	0.03	157,326	0.16	191,203
1985	41,593	0.04	175,376	0.17	216,969
1986	40,056	0.04	180,923	0.16	220,979
1987	37,216	0.03	190,032	0.15	227,248
1988	35,850	0.02	200,345	0.13	236,195
1989	38,545	0.02	227,792	0.12	266,337
1990	56,103	0.03	251,323	0.12	307,426
1991	78,911	0.03	285,108	0.11	364,019
1992	109,094	0.04	316,328	0.11	425,422
1993	151,363	0.05	353,267	0.11	504,630
1994	190,992	0.05	400,460	0.11	591,452
1995	228,122	0.05	432,580	0.10	660,702
1996	272,700	0.06	485,261	0.11	757,961
1997	427,060	0.09	530,647	0.11	957,707
1998	519,039	0.11	532,628	0.12	1,051,670
1999	563,742	0.12	596,794	0.13	1,160,540

Year	INT	(TE-INT)/GDP	GOODS_SERV	GOODS_SERV/GDP	HEALTH
1972	2,216	0.15	15,299	0.09	1,050
1973	2,813	0.13	17,480	0.08	1,124
1974	3,171	0.11	19,689	0.07	1,404
1975	3,719	0.13	22,959	0.07	1,622
1976	3,562	0.15	27,700	0.08	2,423
1977	4,196	0.15	33,244	0.08	3,017
1978	5,321	0.15	43,589	0.09	3,535
1979	7,398	0.16	52,720	0.09	4,368
1980	9,681	0.17	68,723	0.10	5,114
1981	13,852	0.17	86,458	0.11	6,070
1982	16,614	0.18	99,978	0.12	8,197
1983	22,312	0.17	106,860	0.12	9,072
1984	24,751	0.17	120,241	0.12	10,437
1985	30,729	0.18	128,276	0.12	12,411
1986	34,968	0.16	130,363	0.12	13,471
1987	36,909	0.15	135,497	0.10	13,882
1988	40,162	0.13	141,945	0.09	14,796
1989	44,098	0.12	160,474	0.09	16,815
1990	40,211	0.12	184,698	0.08	20,798
1991	35,317	0.13	214,443	0.09	26,794
1992	29,636	0.14	259,175	0.09	34,673
1993	25,213	0.15	293,096	0.09	35,054
1994	21,332	0.16	338,504	0.09	45,785
1995	14,005	0.15	375,506	0.09	52,647
1996	10,150	0.16	421,132	0.09	61,790
1997	15,368	0.20	455,420	0.10	77,367
1998	8,686	0.23	460,889	0.10	77,846
1999	44,730	0.24	471,885	0.10	75,156

Year	HEALTH/GDP	SOCIAL_WELF	SOCIAL_WELF/GDP	WAGE	WAGE/GDP
1972	0.01	955	0.00	6,832	0.04
1973	0.01	1,474	0.00	7,402	0.03
1974	0.00	1,745	0.00	9,520	0.03
1975	0.01	1,981	0.00	11,547	0.04
1976	0.01	2,065	0.00	12,947	0.04
1977	0.01	2,404	0.00	14,692	0.04
1978	0.01	2,348	0.00	16,660	0.03
1979	0.01	3,082	0.00	20,849	0.04
1980	0.01	3,373	0.00	26,569	0.04
1981	0.01	3,698	0.00	40,155	0.05
1982	0.01	4,607	0.00	48,547	0.06
1983	0.01	5,614	0.01	54,710	0.06
1984	0.01	5,928	0.01	58,569	0.06
1985	0.0 .	6,536	0.01	62,909	0.06
1986	0.01	7,119	0.01	67,225	0.06
1987	0.01	7,738	0.01	71,765	0.06
1988	0.01	8,148	0.01	75,043	0.05
1989	0.01	9,247	0.01	89,580	0.05
1990	0.01	11,059	0.01	106,298	0.05
1991	0.01	12,919	0.06	121,093	0.05
1992	0.01	16,799	0.01	144,048	0.05
1993	0.01	17,400	0.01	162,388	0.05
1994	0.01	20,593	0.01	173,356	0.05
1995	0.01	23,189	0.01	223,168	0.05
1996	0.01	28,679	0.01	241,603	0.05
1997	0.02	33,745	0.01	262,316	0.06
1998	0.02	35,222	0.01	281,119	0.06
1999	0.02	38,004	0.01	298,143	0.06

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