



National Library
of Canada

Bibliothèque nationale
du Canada

Canadian Theses Service

Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

Permission has been granted to the National Library of Canada to microfilm this thesis and to lend or sell copies of the film.

The author (copyright owner) has reserved other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without his/her written permission.

L'autorisation a été accordée à la Bibliothèque nationale du Canada de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.

L'auteur (titulaire du droit d'auteur) se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation écrite.

ISBN 0-315-53831-7

THE THEORY AND PRACTICE OF MACROECONOMIC POLICY:
AN ANALYSIS OF ALTERNATIVE GOVERNMENT INTERVENTIONS

by

Gregory Thomas Papanikos

Thesis presented to the School of Graduate
Studies of the University of Ottawa as partial
fulfillment of the requirements for the degree
of Doctor of Philosophy (Economics)

ACKNOWLEDGEMENTS

This study has benefited from the discussions and comments of R.G. Bodkin (University of Ottawa), E.V. Choudhri (Carleton University), J. Kuiper (University of Ottawa), K. Marwah (Carleton University), and M. Seccareccia (University of Ottawa).

The research in part II of this study has benefited from data provided by the Bank of Canada, particularly the data from the RDX2 quarterly model, and Statistics Canada. I would like to thank both institutions.

I would also like to thank the participants in the seminar on Economic Policy for their contributions on different parts of this study. I nevertheless remain solely responsible not only for any errors or omissions, but for the general approach of this study.

At a later stage, this thesis benefited from constructive comments by S. Coulombe, J.G. Loranger and T.K. Rymes.

Finally, I would like to thank my supervisor Thomas Brooks for his continuous support throughout my graduate studies. This study benefited a lot from his contributions.

CURRICULUM STUDIORUM

Gregory Thomas Papanikos was born in Sardinina, Greece. In 1979, he received the Bachelor of Arts degree with honours in economics from the School of Law and Economics, Aristotelian University, Thessaloniki, Greece. In 1981, he received the Master of Arts in Economics with distinction from the University of Ottawa, Ottawa, Ontario, Canada. In 1983, he received the Master of Arts in International Affairs from Carleton University, Ottawa, Ontario, Canada.

A B S T R A C T

The 1970s marked the beginning of a 'crisis' in macroeconomic theory and policy. The economic profession has been divided between those who favour government intervention (and therefore a role for macroeconomic policy) and those who believe in non-government economic intervention, thus rendering macroeconomic policy useless, if not harmful. The severity of economic problems, however, appeared to be more devastating in the 1970s and the early 1980s and this has called for a new approach to macroeconomic policy. Keynesian policies, which dominated the profession in the post World War II period, appeared to be unable to solve the current macroeconomic problems. The entire theory of macroeconomic policy needs a reconsideration and a generalization to include cases where demand management policies are ineffective.

The theory of macroeconomic policy is generalized where Keynesian policies are only one possible policy alternative and are effective only under certain real economic conditions. This generalization of macroeconomic policy is made possible by the use of two important distinctions. First, this study analyzes both demand and supply management by the government. Second, two types of government economic intervention are distinguished: indirect government economic activity and direct government economic activity.

By combining these two distinctions we get four types of policies whose effectiveness depend on the type of economic problem policy-makers are facing and the type of stochastic shocks. It appears that

the policy implications of the Keynesian, Monetarist, and New Classical schools hold if the economy is subject to different types of economic crises. However, the Monetarist and New Classical argument for non-government intervention becomes irrelevant. Instead, the debate should focus on the appropriate (effective) government intervention to be taken, which depends on the type of economic crisis.

The second part of this thesis develops a model to ascertain empirically the policy role of the various government economic policies. For these purposes a small macroeconometric model is developed, which fully specifies all the alternative direct government interventions. This model is estimated using the Canadian experience of the 'trouble' years in the 1970s and the 1980s. It appears that policy-making was not consistent with all the alleged objectives of policy-makers. Better policies can be designed that are more effective in meeting the goals of macroeconomic policy. In particular, policy-makers can re-allocate government expenditures in such a way as to get more output, more employment and less inflation without increasing the total government expenditures. An example of such a policy is state investment that in case of Canada is the most important direct state economic activity.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
ABSTRACT	iv
TABLE OF CONTENTS	vi
INTRODUCTION	1
PART I: THE THEORY OF MACROECONOMIC POLICY.....	7
CHAPTER 1: THE CURRENT STATE OF MACROECONOMIC POLICY...	8
Introduction.....	8
1. A Taxonomy of the Macroeconomic Schools.....	10
2. Non-Government Intervention Approaches.....	16
3. Government Intervention Approaches.....	25
Conclusions.....	36
CHAPTER 2: THE STATE IN MIXED ECONOMIES.....	38
Introduction.....	38
1. Power and Economic Policy.....	40
2. The Scope of State Economic Intervention.....	46
3. The Making of Economic Policy.....	55
Conclusions.....	59
CHAPTER 3: THE THEORY OF ECONOMIC POLICY.....	60
Introduction.....	60
1. The Objectives of Economic Policy.....	62

2. The Elements of Economic Policy.....	71
3. A Suggested Classification.....	80
Conclusions.....	87
CHAPTER 4: THE EFFECTIVENESS OF ECONOMIC POLICY.....	88
Introduction.....	88
1. Demand Management Policies.....	90
2. Supply Management Policies.....	96
3. Mixed Policy.....	105
Conclusions.....	110
CHAPTER 5: MACROECONOMIC POLICY WITH DIRECT AND INDIRECT GOVERNMENT ECONOMIC INTERVENTION.....	126
Introduction	126
1. A Fixed Real Wage Model.....	130
1.1 Aggregate Demand and Aggregate Supply.....	138
1.2 Indirect and Direct Policies.....	141
1.3 Stabilization Policy.....	147
2. A Neoclassical Framework.....	152
2.1 The General Model.....	152
2.2 The Classical Paradigm.....	158
2.3 The Equilibrium Keynesian Model.....	162
2.4 Fixed Nominal Wage Rate Model.....	164
Conclusions.....	167
Appendix.....	169
PART II: AN ECONOMETRIC MODEL FOR POLICY ANALYSIS.....	171
CHAPTER 6: AGGREGATE DEMAND.....	172
Introduction.....	172

1. Private Consumption.....	172
2. Government Consumption.....	177
3. Private Investment.....	184
4. Government Investment.....	187
5. Net Foreign Demand.....	192
Conclusions.....	194
 CHAPTER 7: AGGREGATE SUPPLY.....	 196
Introduction.....	196
1. Private Labor Demand.....	199
2. State Labor Demand.....	204
3. Labor Supply.....	209
4. Technical Relations.....	212
5. Price Functions.....	216
Conclusions.....	220
 CHAPTER 8: MONETARY SECTOR.....	 222
Introduction.....	222
1. State Money Supply.....	225
2. Private Money Supply.....	229
3. Money Demand.....	232
4. The Money Market.....	239
Conclusions.....	242
 CHAPTER 9: THE OVERALL MODEL.....	 244
Introduction.....	244
1. Structural Equations.....	246
2. The Sectors of the Model.....	250
3. The Scope and Extentions of the Model.....	253
Conclusions.....	257

CHAPTER 10: STRUCTURAL ESTIMATION.....	258
Introduction.....	258
1. An Overview of the Canadian Economy.....	259
2. Sources of Data.....	263
3. The Model.....	267
4. Structural Estimation.....	271
Conclusions.....	280
CHAPTER 11: POLICY IMPLICATIONS.....	281
Introduction.....	281
1. Simulation.....	282
2. Structural Analysis.....	286
3. Balanced Budget Policies.....	292
4. Policy Experiments with Exogenous State Variables.....	294
Conclusions.....	297
GENERAL CONCLUSIONS.....	299
REFERENCES.....	302

I N T R O D U C T I O N

The principal objective of this study is to show how the theory of macroeconomic policy can be generalized to incorporate all types of government economic interventions. The mainstream approach to the theory of macroeconomic policy is to discuss only one aspect of government economic intervention: demand management policies or more general indirect state economic activities.(1) Other important state economic interventions are completely ignored by macroeconomic theory. The most striking example is public employment that has received no or very marginal attention by the theory of macroeconomic policy. This despite the fact that public employment or what we call state labor demand constitutes an important part of total employment in many advanced countries with mixed economies.(2)

There are three questions that are central to this study: (i) why did the theory of economic policy fail to take into account all government economic activities? (ii) how does a generalization of the theory of economic policy alter the view on policy effectiveness and therefore the desirability of state intervention? (iii) how is the entire macroeconometric exercise for policy analysis affected by this view on the role of state economic intervention?

(1) Indirect state economic activities are defined as those state actions which aim at affecting the consumption (demand) and the production (supply) decisions of the private sector.

(2) State labor demand has been used as an instrument to create either permanent or temporary jobs. The creation of temporary jobs in the public sector in periods of high unemployment have been used by many advanced countries with very effective results. An evaluation of these policies is given in an OECD publication: Direct job creation in the public sector in 1980. It is surprising that the macroeconomic theory has ignored the role that state labor demand can play as a policy instrument.

The first question is the most important one because it relates to the nature of the alternative state economic interventions. There are three reasons that can explain why the theory of macroeconomic policy has failed to take into account all systematic government economic actions: (a) the influence of Keynesian theory, (b) a distrust on state economic activities, and (c) the contradictory nature of the alternative state economic interventions.

The influence of Keynesian economics needs little explanation. All macroeconomic textbooks are preoccupied with the Keynesian policy prescriptions of indirect demand management policies. The rise of Monetarism did not alter this practice. The emergency of new macroeconomic schools contributed nothing new to the alternative state actions. Thus, all macroeconomic schools use assumptions about state economic actions that assume a very limited state role, i.e., limited only to demand or indirect economic policies.

Another important reason that explains this restricted view on state economic actions is the belief that the state will always produce results that are inferior to those of the private sector. However, there exists neither a sound theoretical explanation nor empirical evidence to justify such a view on state economic actions. On the contrary, there is an entire literature albeit at the microeconomic level, which has shown that the private sector may not produce efficient results because the social cost far exceeds the private benefits.

The third reason that might explain why economic policy does not consider all the alternative state actions is the contradictory nature of these alternative economic policies. As an illustration let

us compare two state economic actions that have different aggregate economic effects. The state has the power to become either a direct producer or a direct consumer of goods and services. The classical example of the first type of government intervention is public enterprises. The classical example of the latter type of state intervention is the purchase of military equipment from private companies. Given certain conditions that are examined later in this study, both state economic interventions increase output. But the two policies have a different effect on the structure of output. The first type of state economic activity reduces the role of the private sector by increasing the share of state production. The second type of state intervention on the demand side has the opposite effect because it increases the share of private output. If a government is committed to preserving the private mode of production, which is the case for most of the governments in the Western world, then it is not surprising that the policy of direct production has received no attention by either the theorists or the practitioners of macroeconomic policies. In this study here we fully take into account these alternative state actions.

One might argue that the inclusion of these state economic activities might make no difference to the nature of the current debate in the theory of macroeconomic policy on the policy effectiveness and therefore on the arguments raised in favour of or against government economic intervention. As a matter of fact, it is the purpose of this study to show that this incomplete treatment of state economic interventions makes a substantial difference to the above argument. The argument for government or government non-intervention should be replaced by the argument about which type of

government intervention is more effective. As it will be shown in part one, under certain conditions, one type of economic policy, i.e., Keynesian policies, might not be effective, but under the same conditions another type of government intervention, i.e., direct supply management policies, can have real effects. Thus the entire argument of policy effectiveness becomes irrelevant when all alternative state economic activities are considered. What matters is the type of government intervention.

The conventional view on the extent of state economic actions has influenced the construction of macroeconometric models for policy analysis. The new view suggested in this study has important implications for macroeconometric model-building. The state economic actions should be explicitly modelled in both the demand and the supply side of the economy. In part two of this study, we show the direction of building a macroeconometric model that highlights this new feature on state economic interventions. Furthermore, we use the Canadian experience of the 1970s and the 1980s to show how macroeconomic policy could have been more effective if more attention was paid to other types of government intervention as well.

As we said above, this study is justified because state economic activities have been incompletely treated by the theory of economic policy. But there are many ways to approach our claimed generalization of the theory of economic policy. The least we can do is to inform the reader from the beginning about the assumptions on which our approach is based. These assumptions are explicitly or implicitly made throughout this study.

First of all, our study deals primarily with the advanced

countries with mixed economies. The basic assumption made for these economies is that they are in a stage of permanent excess supply in both the product and the labor market. As a matter of fact, it is this feature that calls for systematic government economic intervention, which is what is meant by economic policy. If there were no such a macroeconomic problem, there would be no need for government intervention. Only an irrational government will intervene in an economy without an economic crisis. Fortunately, irrationality as an assumption is not favoured by many economists. Those macroeconomic approaches that assume that all markets clear rule out by definition any role to macroeconomic policy. Thus their theoretical framework, logical or not, becomes irrelevant to the advanced capitalist economies.

Another assumption that characterizes this study is the efficient aspect of state production. This is an important one because in this study we explicitly take into account state production as an alternative policy. The assumption we make is that state production is as efficient as private production. Many would argue against this assumption but they should keep in mind that there is no a priori theoretical reason why the government cannot be as efficient as private production. After all they can hire the same managers that private firms hire and give them the same incentives. One explanation why they do not do this might be the fact that economic theory has ignored that state production is used as an instrument of economic policy and not to maximize profits of the public sector. This is supported by the evidence on state involvement on the supply side of the economy. The state very rarely nationalizes or expands to new economic activities that have a profitable future. This is always

left for the private sector.

The last point we should mention in the introduction is that our approach draws from many schools of macroeconomics. The criteria used to select which approach gives the best explanation of a particular economic question are logic and relevance. But in a field so practical as the one of economic policy, logical statements are not enough. What we need are theoretical models that reflect the economic reality. Sometimes we may not have even logical explanations of why a certain economic phenomenon exists, but this by no means should imply that nothing can be done. Consider unemployment as an example. Many economists argue that there is no good (logical, rational) explanation of why involuntary unemployment exists, but this does not imply that it does not exist. It is one thing not being able to explain it, but it is absurd to deny it simply because no logical explanation exists. Thus, economic theories that assume unemployment and try to develop policies to reduce it are more useful to policy-makers than theories that assume it inexistent simply because they cannot explain it. Our approach in this study attempts to make a contribution to the first type of theories.

PART I : THE THEORY OF MACROECONOMIC POLICY

The first chapter of this part reviews the literature on macroeconomic policy. The various approaches are discussed in light of their cosmotheory, theoretical explanation and policy recommendations. The second chapter presents an analysis of the state in relation to its macroeconomic policy role. Most macroeconomic approaches completely ignore the role of the state by treating it as an exogenous entity.

In the third chapter we discuss the theory of economic policy and present a new classification of macroeconomic policies that constitutes a generalization of the theory of economic policy. Chapters four shows how the new view on systematic government economic interventions affect the conclusions on policy effectiveness under different types of economic crises.

For the purposes of this work, chapter five constitutes the most important contribution. A small theoretical real macroeconomic model is developed to explain how alternative government interventions may be effective. In the same chapter we show the effects of government policies on the budget deficit, stagflation and crowding out of private economic activities.

CHAPTER ONE

THE CURRENT STATE OF MACROECONOMIC POLICY

Introduction

There is one assertion that most macroeconomists today would certainly agree upon: no school can be considered as a dominant one. The decline of Keynesian economics and the rise of monetarism in both theory and practice, the rise of the new classical school in theory and the recent re-emergence of Keynesian economics(1) in a period of fifteen years shows that macroeconomic theory and practice is in a stage of crisis. Many economists are very sceptical about the future direction of the macroeconomic research and their disagreements have become as apparent as never before.(2) It has also had serious implications on the way policy is thought and practiced.

The current debate is not new. It goes back to Keynes' years when he struggled to show and to persuade others that the classical paradigm could not be a useful guide to policy-makers. However, what is new is the means by which this debate is carried out. Mathematical tools and rigorous, concrete and very sophisticated models are used so frequently that the non-technical economist could not participate in the debate. Fortunately, if we strip the debate from its 'fancy' math we left with something that is easy to debate and has been debated in the period preceded the publication of Keynes 'General Theory'. The main issue that is discussed in the current literature

(1) See Howitt(1986) and Startz(1984)

(2) Klammer(1983) presents an excellent anthology of the macroeconomic rivalries.

of macroeconomics is whether or not the market system if left alone is capable of producing results that are considered desirable. Keynes fifty years ago said "No, the private system may not produce such results. It needs direction. It requires government intervention." Monetarists and New Classical economists say "Yes, the private system if left alone can produce 'optimal' results. It needs no direction. It requires no government intervention." This is similar to the classical world that Keynes tried to dismantle half a century ago.

Macroeconomic policy is at crossroads. There is a need for new developments and new ideas that can get the theory and practice of macroeconomic policy out of the current stalemate. One possible direction could be the re-examination of the role of government intervention because it will be argued that its role has not been fully explored. The alleged failure of Keynesian policies in the 1970s (not though in the 1980s) do not necessarily suggest that we should go back to the pre-1936 period.

On the contrary, one should analyze very carefully the experience of Keynesian policies as only one type of government economic intervention out of a number of other possible government interventions that have been ignored up to now in the literature of macroeconomic policy. Macroeconomic schools have examined only one aspect of government intervention, namely demand management policies through the use of fiscal and monetary policies. Other policies, such as direct government interventions, have not been fully analyzed. It is the purpose of this chapter to show to what extent the current debate on macroeconomics has exhausted all the alternative government interventions.

This chapter is divided into three sections. Section one classifies the alternative approaches based on each school's cosmotheory, views on government economic intervention and policy recommendations. We may distinguish five major schools of macroeconomics: the New Classical, the Monetarist, the Keynesian, the Post Keynesian and the Radical. The policy recommendations of these schools are analyzed in the remaining three parts of this chapter. Section two examines the government economic non-intervention approaches namely, the New Classical and the Monetarist. The last section surveys the Keynesian and the Post Keynesian approaches.

1. A Taxonomy of the Macroeconomic Schools

The relation between the theory and practice of economic policy has been very close in the last few decades. The purpose of economic theory is to analyze and explain how the economic world works. In addition, its task is to come up with ideas and specific proposals for making the economy work better. It is the latter part of economic inquiry that relates to policy issues and is of interest to policy-makers and to the survey in this chapter.

Nowhere is this close relation between economic theory and policy so apparent as in the field of macroeconomics. Macroeconomic theory is strongly related to macroeconomic policy. The entire field has been developed in the last fifty years with its main purpose being to correct economic maladies such as unemployment, economic stagnation, and inflation. Macroeconomic theory has become the policy-makers' arsenal. There are many divisions within the field of macroeconomic

theory as to how policy-makers should or should not use the various tools of economic policies. These divisions represent different schools of macroeconomics whose cosmotheory varies. Their explanations of how wealth is produced differ as do their policy recommendations.

In this section we attempt to classify these schools of economic thought on the basis of three elements: cosmotheory, an explanation of how the economy works, and policy recommendations. Our purpose is not to evaluate the merits of each school in terms of standard scientific criteria such as logic, rigor and relevance, but simply to present them as potential options of policy-makers. In other words, we classify whatever is available today from the various schools of macroeconomic theory. But, first let us discuss the three elements that our classification is based on.

First, economic schools differ in their cosmotheory, i.e., how they view the world. It is their philosophical framework, their 'ideological bias'(3), which lays the groundwork of their scientific discourse. To use Schumpeter's term, it is their 'vision' of world affairs that influences their scientific inquiry. There are many ways to classify cosmotheories relative to economic analysis but for our present purpose we would like to distinguish two groups.(4) In the first belong those schools which accept the current social system. The second group consists of those schools that do not

(3) This is not necessarily an impediment to scientific inquiry and advancement. In this aspect see J. Robinson(1962, ch. 1).

(4) An alternative way is to follow the spectrum of political formations in the advanced mixed economies. For example, Tobin(1981) uses terms such as 'conservative ideology', 'right wing' to classify the various schools. This is not the approach we follow here.

adhere to, and therefore, do not accept, the existence of the current social organization. Those that adhere to the current system of capitalism constitute the majority. This support for the existing social system is based on two arguments. First, one can believe that the capitalist organization of society is the only natural state of human organization. Second, the belief in capitalism can be based on arguments of efficiency. This view accepts the existence of other social formations but considers them less efficient in comparison to capitalism. This cosmotheory underlines the writings of many macroeconomic schools. It is the dominant ideology. Macroeconomic schools such as the New Classical, Monetarist, Keynesian, and Post Keynesian proceed with their economic analysis taking as given the existence of the capitalist system. This does not imply that they do not favour social and institutional changes but these are confined within the boundaries of the existing system.

Those who do not accept the existing social system have a different 'ideological bias'. This is the radical school. Their policy recommendations are of the essence to private production. Their cosmotheory is based on historical materialism, which states that social systems are historical and therefore transitory. This is true for all social systems including the current capitalist one. However, they do believe that any new social development, including the capitalist, is an improvement over the preceding one.

Those that accept the existing social order do not necessarily agree on how the system works. There are two main lines of thought. First, there are the adherents of Adam Smith's Wealth of Nations who believe that the market system by itself is capable of solving a

number of economic problems.(5) If an external shock brings disequilibrium, the capitalist system is capable of restoring equilibrium by itself. What is good for the individual is good for the society. This view appears to be shared by both the New Classical and the Monetarist school.

The view that the private system can function efficiently if it were left alone was challenged by Keynes. The Keynesian and Post Keynesian explanation of how the capitalist system works assert that if the private organization of production is left alone, economic crises are unavoidable. The system does not operate efficiently because not all existing labor and capital is fully utilized and therefore output (wealth) is not maximized. The system itself develops impediments which cause markets to be in disequilibrium for long periods of time. These two schools also claim that perfect competition is not the right assumption in explaining the macroeconomic world.

These two types of explanations of how capitalism works have important implications for the economic role of governments and therefore policy-makers. Those that believe in the pure market system do not favour government economic intervention.(6) On the other hand, those that do not put great trust in the market system favour government economic intervention to correct what they view as market failures. Their influence has been fundamental in shaping the

(5) However, they cite the first books of the Wealth of Nation. Smith at the end of his monumental work was skeptical about the alienation that the division of labor produces despite the tremendous increase in wealth.

(6) They do accept the existence of the state but it should be restricted to non-economic activities.

type of capitalist economies we currently have, i.e., a welfare state.

The third element in our classification relates to the policy recommendations which are relevant to the economic role of government. First, we have those that believe that the economic intervention of the government has no systematic real effect in either the short-run or the long-run. This is the New Classical school.(7) Monetarists, on the other hand, believe that government economic intervention can have real effects in the short-run but not in the long-run. However, they would recommend non-intervention even in the short-run because the uncertainty involved makes systematic policy-making very difficult, if not harmful. Keynesians have opposite views regarding the role of macroeconomic policy. They believe that systematic macroeconomic policy can have real effects and can stabilize the economy. However, it seems they agree with monetarists about the long-run effects of economic policy.(8) Keynesians favour demand management policies which use such instruments as taxes, money supply, interest rates, government expenditures, and exchange rate. On the other hand, Post Keynesians consider the economic role of government as beneficial and favour institutional changes such as the use of planning, nationalization, workers' councils, and the socialization of investment. In other

(7) This school is known as the Rational Expectations school. Other names have been given by Laidler(1981) as Neo Austrians or Tobin(1981) as Monetarism Mark II.

(8) However, it seems there is a big disagreement about the length of the short and long-run periods. A Keynesian would put the long-run further into the future because 'in the long-run we are all dead'. Thus, the long-run becomes irrelevant. A Monetarist would argue for a shorter length because the 'long-run is now'. In between we can put Abba Lerner's view that 'in the long-run we find ourselves in another short-run'.

words, they favour qualitative policies as opposed to quantitative policies.(9) In the following table we present, in a schematic way, the 'menu' of macroeconomic schools.

Table 1.1

<u>A Taxonomy of Macroeconomic Schools</u>			
	COSMOTHEORY	EXPLANATION	POLICY
NEW CLASSICAL	Accepting the social system	The private system can work by itself	No real effect
MONETARIST	The Same	The Same	In long-run no real effect
KEYNESIAN	The Same	The private system needs direction	Demand policies can work
POST KEYNESIAN	The same	The private system needs restriction and coordination.	Institutional changes are required
RADICAL	The existing system is transitory	The private system is inherently unstable	No solution but a change in the social system

The above table represents the five major alternative theories and policy recommendations currently available in macroeconomic literature. Which one a particular policy-maker chooses depends on his own preferences and on his society (these are examined in the next chapter).

Policy-makers can choose between five schools of thought. Each school has its own explanation about the current economic problems of inflation, unemployment and economic growth (business cycles). Each school suggests a different course of action regarding the solution

(9) In chapter three we provide definitions of alternative policies.

to these problems. What each has to offer to macroeconomic policy is discussed in the remaining two sections of this chapter. The radical school is not surveyed because its policy recommendations go beyond the system of mixed economy in which we are primarily interested.

2. Government Non-Intervention Approaches

The classification presented in the previous section made a fundamental distinction between those schools which argue against government economic intervention and those that support it. One can argue that their entire theoretical framework has been molded to justify their conclusion of either supporting or not supporting systematic government economic intervention. There are two schools which seem to vigorously oppose any government economic action to stabilize the economy. These schools are the New Classical and the Monetarist. The latter has influenced the conduct of macroeconomic policy in a number of countries since the mid-70's. The former has been very influential in shaping the minds of young economists, particularly in the United States.

The New Classical School

The basic postulates of this school emerged in the 1970's out of the writings of Lucas(1969, 1970, 1972, 1973, and 1975), Sargent and Wallace(1975, and 1976) and Barro(1976).(10) The schools basic postulates are: (i) all markets clear including the labor market in

(10) See Maddock(1984) and Sheffrin(1983).

both the short and the long-run, (ii) the natural rate hypothesis holds, (iii) individuals form their expectations rationally, i.e. they use all the available information to infer the future course of economic variables and (iv) aggregate supply is a function of the difference between the actual and the anticipated price level. The New Classical models using these postulates are capable to show a number of things.

First, the price level is a function of money supply only. This is hardly a surprising result. In this aspect, New Classicals are very close to monetarists. They claim that money supply growth should be held responsible for the inflation rate. In their framework money supply responds to the past behaviour of economic activity plus some stochastic variation. Policy makers can control the first (the systematic part) but not the latter (the unsystematic part). The price level depends on both the systematic and the unsystematic part of money supply. The inflation rate is a function of the policy-makers' money supply rule. Thus, inflation is a monetary phenomenon. Policy-makers can have a great impact on the inflation rate by simply controlling the growth of money supply. Policy-makers in a New Classical world have a role to play in controlling inflation but this is a very trivial task because it is the policy-makers that have created the inflation in the first place. They are not only the solution to, but also the source of the, problem.

Second, the New Classical school postulates that monetary policy has no effect on the level of output and, therefore, employment.(13)

(13) In the short-run there is a unique relation between the level of output and the level of employment. This relationship is further discussed in chapter four.

According to New Classical economics, unemployment should not be a problem. This is hardly a surprising result if one assumes that all markets, including the labor market, clear in the short-run. The only question that arises is that if inflation created by money supply growth has no effect on the level of output and employment, then what is the cost of inflation? Lucas(1978, p. 357) has answered this question by assuming that inflation creates uncertainty. It should be the task of policy-makers to reduce 'business cycle risk' which can be achieved by 'monetary and fiscal policies directed at price stability'. The reason that monetary policy-makers have no effect on output and employment is that their instrument, the response coefficient in the systematic part of the money supply rule, does not appear in the reduced form equation for output. A change in this response coefficient, i.e., a change in policy, is fully taken into account by individuals.(14)

New Classical economics offers a new theory of economic policy but it is not complete yet.(15) It considers monetary policy as an ineffective instrument of demand management policy.(16) However, other types of government policies can have real effects and this can be perfectly consistent with the New Classical assumptions.(17) As we

(14) This is the so-called Lucas-critique of the econometric practice for policy analysis; see Lucas(1975).

(15) As a matter of fact, Lucas(1983, p. 17) has argued that the New Classical school does not offer a new economic policy at all but the Sargent and Wallace contributions have had significant implications for monetary policy. Recently, Lucas(1986) has attempted to provide some guidelines as to how monetary and fiscal policy should be conducted but still more work is required.

(16) McCallum and Whitaker(1979) have tackled fiscal policy as an instrument of demand management policies.

(17) See chapter four. Tobin(1980, p. 21) is wrong when he concludes that New Classical economists assume that no economic policy can have any real effect. They may believe in that, but their writings render only monetary policy ineffective as a demand management tool.

have already seen, they advocate monetary policy to control inflation because inflation is a monetary phenomenon. The only problem is that if inflation is imported through, for example, an oil price increase or through an increase in the foreign money supply, then domestic monetary policy may not be able to control inflation.(18)

The third implication the New Classical school relates to the fluctuations in the output. As a matter of fact, their contributions aimed at explaining the business cycle phenomenon.(19) The key elements in the New Classical explanation of business cycle are that markets are always in equilibrium and that there is a distinction between temporary and permanent changes in relative prices, particularly in the labor market.(20) Output fluctuations are the result of temporary changes in the real wage rate, which induce large changes in the labor supply. Permanent changes in the real wage rate have a small effect on labor supply and therefore output: see Sheffrin(1983, pp. 31-32). Policy-makers appear to have no role to play in affecting economic growth, through monetary policy at least. It is interesting to note that fiscal policy might have a real effect but this has not been discussed in the literature of the New Classical school. For example, a temporary change in wage tax rates can induce large output fluctuations.

Lucas(1981) discusses only monetary policy. However, on page 563 he says that 'fiscal policy has no ability to stabilize the economy' but this was not proven by him(1981) or by Sargent(1976a, and 1976b), whom he cites. Both citations do not analyze fiscal policy the way Sargent and Wallace have analyzed monetary policy. The only systematic analysis seems to have been provided by Sargent and Wallace(1981 and 1984) where they discuss fiscal policy (government deficits) but relate it to monetary policy.

(18) The implications of the New Classical postulates for a small open economy have been evaluated by Flood(1979) and Cox(1980).

(19) See the Introduction in Lucas(1983).

(20) See Lucas(1977 and 1978).

Recently another stream of the New Classical school has attempted to explain business cycles as the result of the intertemporal investment and consumption choices of individuals. It has been argued that the observed fluctuations of output (serial correlation) can be explained either by the nature of the investment projects which require time to be fully realized (see Kydland and Prescott (1982)) or that consumers will tend to spread through time any current shock in their consumption (see Long and Plosser (1983)). This is the so-called real business cycle theory, which again does not allow for any government stabilization role.

It appears that the New Classical school has not come up with a complete theory of macroeconomic policy yet. Their main conclusion is that monetary policy has no real effects as a demand management policy. However, it seems that New Classical economists would be against any type of government intervention. This assumption is based on their two postulates that all markets clear and that individuals are rational. However, a question arises about the rationality of policy-makers. Why are policy-makers pursuing policies that have no real effect? A rational policy-maker would never follow such an economic policy. This problem has been tackled within the framework of the New Classical school by Barro and Gordon(1983), but they have not been able to rationalize policy-makers' decisions.

The Monetarist School

Monetarism has influenced the policy making of many capitalist countries since the mid-70's. Their postulates were advanced in the

decade preceding their general acceptance. In 1963 Friedman and Schwartz published a study on the relation between the money supply and aggregate economic activity. Their study focused on the economic experience of the United States in 1867-1960. Their main conclusion was that money supply appeared to be positively related to money income and prices. Furthermore, the same year(1963), Friedman and Meiselman published an empirical study which favoured monetary policy over fiscal policy. Later studies by Friedman and others formulated the basic elements of the Monetarist school(21) which resulted in influencing both the economics profession and actual policy making.(22) But what are the policy implications of the monetarist school? How should a policy-maker act if monetarism is accepted? These are the questions we attempt to answer in this section.

The basic postulates of the monetarist school are (see Laidler(1981, p. 1)): (i) the quantity theory of money, (ii) the quantity of money is the most important variable in explaining money income, (iii) in the short-run there is an inverse relation between the rate of unemployment and the inflation rate, and (iv) in the long-run no trade-off exists. The implications of monetarist policies apply only to the demand management policies as these will be defined in chapter three. It is not clear, however, whether they apply to direct or indirect demand management policies but the latter are what the monetarists likely have in mind. Their argument refers to the appropriate instrument in affecting aggregate demand, which

(21) See Friedman(1968, 1970, 1971, 1972) and Brunner and Meltzer(1972). See Frey, et. al.(1983) for the influence of monetarist ideas.

(22) Frey et al.,(1983) have concluded otherwise on the extent of acceptance of Monetarist doctrines by the economics profession.

for them is the money supply.(23)

What are their policy prescriptions for inflation, unemployment and economic growth? Not surprisingly, inflation is initiated by an increase in the money supply growth. Therefore, the only solution to inflation is to reduce monetary expansion. However, price fluctuations in the short-run might be due to non-monetary factors but this is because it takes time for the economy to absorb fully external shocks.(24) A monetarist equation for inflation (P) would make it a function of the aggregate demand gap ($Y-Y^*$), the expected inflation rate (P^*) and other factors (V):

$$P = g(Y-Y^*) + b P^* + V$$

A monetarist would argue that (g) is close to zero so that there is no trade-off between inflation and real economic activity, i.e., inflation has no effect on real economic variables such as output and employment. Furthermore, they would argue that (b) is close to one. In other words, the Phillips curve is vertical. However, if expectations are adaptive, there is always a gap between what people expect and what actually occurs. This might leave room for monetary policy to be effective. In the long-run, however, inflation becomes solely a monetary phenomenon.

Friedman(1968) has argued that money supply as an instrument for demand management policies has no real systematic effect but affects the stability of the system including the inflation rate. The best

(23) Friedman and Meiselman(1963, p. 213) conclude '... that control over the stock of money is a far more useful tool for affecting the level of aggregate demand than control over autonomous expenditures.'
(24) See Laidler(1981, p. 9)

policy according to Friedman(1968) is '...a steady rate of growth in a specified monetary total.'

What about unemployment? Monetarists would argue that at any given moment in time there is a level of unemployment which can be considered as natural, given the structural characteristics of a particular economy. This does allow for disequilibrium in the labor market but only in the short-run. In the long-run all markets clear including the labor market.(25) Thus, monetarists would accept an upward sloping aggregate supply curve in the short-run. However, in the long-run the expectations-augmented Phillips curve implies that workers restore their supply of labor because they have realized that inflation has left relative prices unchanged. What is important is that creating inflation cannot fool workers forever. Starting with a given level of inflation, a higher rate of inflation will be required for real effects. In the end, the economy might end up with a hyperinflation with no real effects.(26) Thus, the best thing policy-makers can do is not to attempt to 'lean against the wind' through monetary or fiscal policy. Setting money supply at a constant rate of growth will suffice. As was the case with the New Classical school, the Monetarist school does not discuss other policies other than those which indirectly affect aggregate demand.(27)

How do monetarists explain business cycles (economic growth)? Not

(25) This is the most important difference between the New Classical and the Monetarist schools. The former assume that all markets clear even in the short-run; see Laidler(1981).

(26) The German hyperinflation in the 1920's had no real effects, according to Barro(1984, pp. 192-194). Monetarists do consider the welfare implications of inflation as these are discussed in chapter three.

(27) A classification of policies is given in chapter three.

surprisingly, again money is held responsible for output fluctuations, including the biggest one in the 1930's. What monetarists would argue is that inappropriate monetary policy has initiated a number of economic crises. Friedman(1971, p. 331) explained the growth of nominal income with the following equation:

$$Y = Y^* + d(M - Y^*) \quad d > 1$$

where

Y : actual rate of growth of nominal income.

Y*: the permanent or anticipated growth of nominal income.

M : the growth of money supply.

Friedman(1971) has argued that fluctuations in the national output can be explained using the above equation. We can distinguish three cases. First, if policy-makers increase money supply at the same rate as the expected change in the nominal income, then anticipated and actual nominal income changes are the same. The simple quantity equation holds. Second, if $M > Y^*$, then the actual nominal income is higher than the rate of change of money supply, i.e., monetary authorities have initiated a boom. The simple quantity equation can hold only if velocity increases. Third, a recession or depression, such as the one in the 1930's, can be explained by an increase in the money supply growth which is lower than the increase in the anticipated nominal income. Velocity of money decreases. However, these changes in the money supply growth and their effect on output cannot be exploited by policy-makers because permanent or anticipated output is affected as well.

In conclusion, the monetarist school would argue that policy-makers, particularly the monetary authorities, should play a small

role. Fixing the money supply growth at a given rate, i.e. the rate of growth of output, will be sufficient. This policy can be used to bring inflation down. Appropriate reductions in the money supply growth need not create recessions.(28) Monetarist policies have been applied in major capitalist countries since the mid-70's. The results have been mixed. They were successful in lowering inflation but did so at the cost of higher unemployment. It seems that the trade-off works again. Tobin(1981) was very critical with respect to this aspect of monetarist policy. He blamed monetarist policies for the recessions in the 1970's and the early 1980's, the worst since the 1930's. He argued that the period before the 1970's and after the last war was characterized by a better economic performance. He praised government intervention of the Keynesian type for this achievement, which is the subject of the next section.

3. Government Intervention Approaches

The basic characteristic of the government intervention approaches is that the capitalist system (the market system) is assumed to be inherently unstable. It is for this reason that government economic intervention is considered by these approaches appropriate for stabilization purposes. A corollary of their arguments is that markets do not always clear and equilibrium cannot be achieved by the private system itself. They do not reject the capitalist system. On the contrary, it appears that they trust the market mechanism but with the government playing an active role in correcting any market

(28) See Brunner in an interview by Klamer(1983, p. 187).

failure. The influence of these ideas has been remarkably strong in the post Second World War period, resulting in a new type of state, i.e., a welfare state.

In this section we examine two approaches: the Keynesian and the Post-Keynesian. The name of Keynes appears in both schools, thus indicating the source of these approaches. The first school has become the dominant school in macroeconomics. Two decades ago we would have said that macroeconomics is synonymous with Keynesian economics. This is no longer true. On the other hand, the Post-Keynesian school has had some influence in Europe and the United States but is less coherent as a school. It is thus very difficult to present its basic arguments. This task with respect to the three macroeconomic goals is undertaken after we discuss the Keynesian school.

The Keynesian Revolution

Our interest here relates specifically to the influence of the Keynesian school on policy issues. We are not interested in the relation between Keynes' thought and that of the Keynesians. However, the school is based on Keynes' writings as these were interpreted (Joan Robinson would say bastardized) by the neoclassical synthesis.(29) The neoclassical synthesis has become the textbook approach to macroeconomics.

(29) A number of writers can be held 'responsible' for the synthesis. The most important ones are Hicks(1937) and Modigliani(1944). The term 'Keynesian Revolution' was used for the first time by L. Klein(1947).

Keynesian policies were preoccupied with the problem of unemployment, which was the evil which they were supposed to exorcise. How was that supposed to be achieved? Keynesian economics assume that the labor market does not always clear for a number of reasons: lack of aggregate demand, wage rigidities, wage contracts, etc. This disequilibrium in the labor market calls for state employment policies. The tool used to achieve this is fiscal measures such as taxes and state expenditures that aim at aggregate demand. Keynesian economics favours demand management policies, which does not come as a surprise since they blame the lack of effective demand as the cause of unemployment. However, Keynes(1937) himself was skeptical as to how far fiscal measures can go in reducing unemployment. As Hutchison explained(1977, p.14), Keynes considered that an unemployment rate even as high as ten percent might initiate inflationary pressures. This apparent trade-off between unemployment and inflation was incorporated into the Keynesian framework after the studies by Phillips(1958), by Samuelson and Solow(1960), and by Lipsey(1960).(30)

The trade-off curve allowed policy-makers to choose a mix of two evils: unemployment and inflation. A higher inflation rate can be compensated by a lower unemployment rate and vice versa. The optimism was so high that Keynesian policies were thought to be consistent with the economic program of almost all political parties.(31) However, during the 1970's this analysis became obsolete. Inflation and unemployment were not mutually exclusive events, but coexisted.

(30) A survey is given by Frisch(1977, 1983) and Santomero and Seater(1978).

(31) A liberal will choose the low unemployment-high inflation mix, a conservative the high unemployment-low inflation one.

Stagflation became a big problem for Keynesian policies. Demand management policies were not able to deal with the two problems simultaneously. Alternative policies were required. Unemployment can be alleviated through traditional demand management policies. Inflation requires a different policy. But how is inflation created?

Keynesians distinguish between demand-pull and cost-push inflation. The first is created by an increase in aggregate demand. The latter could be initiated by trade unions' demands for higher wages or by an increase in the cost of capital and raw materials. The Keynesian policy recommendations are for a decrease in aggregate demand, if unemployment is not a problem. Alternatively, policy-makers can use demand management policies to regulate employment and income policies, such as wage and price controls or tax-based income policies, to complement the demand management policies and control inflation.(32) The reactions to these types of Keynesian policies have been mixed and few countries now attempt to apply all of them.

The new generation of Keynesian economists had to defend the basic assumption of the school, i.e., labor market disequilibrium.(33) The research on microfoundations of macroeconomics was initiated by the need to explain the functioning of the labor market. The young generation of Keynesians has argued that the labor market is characterized by wage and employment fixing behaviour through contracts that render macroeconomic (Keynesian) policies

(32) Income policies have been extensively discussed, see Layard(1981), Walker(1982), Bodkin(1981), and the original contribution of Wallich and Weintraub(1971).

(33) A list of the new generation should include Alan S. Blinder, Stanley Fischer, Benjamin Friedman, and John B. Taylor.

effective.(34)

Keynesian macroeconomic policies are considered as short-run policies. The aim is not to eliminate business cycles but to make their effects less severe. Keynes(1936) viewed the market system as unstable because the most important economic activity, i.e., investment, depends on factors such as uncertainty, future expectations and 'animal spirits'. The linkage between investment and output growth is the multiplier, which depends on the consumption behaviour, which in turn depends on income. Thus, the system is closely interdependent. A change in the structure of the aggregate demand may cause an economic crisis. The Keynesian approach views economic growth as the result of effective demand. It is a demand-oriented theory. To stimulate the economy, the policy-makers should generate an appropriate level of aggregate demand. This can be achieved by changes in government expenditures and taxes. It appears that Keynesian policies are not concerned with the long-run implications of their recommendations. One reason is that in the long-run they do believe in the market clearing assumption. Long-run concerns, and therefore economic growth, has been the focus of the Post Keynesian school, to which we now turn.

(34) The original contributions on the contract theory were developed by Azariadis(1975), Bailey(1974), and Gray(1976, 1978). The policy implications were developed by Fischer(1977) and Phelps and Taylor(1977). A survey is given by Rosen(1985).

The Post Keynesian Alternative

The Post Keynesian approach has not been as coherent as the other schools of macroeconomics.(35) Nevertheless, the school's views are based on the writings of economists who have made great contributions to economic analysis.(36) They draw their analysis from Kalecki and Keynes.(37) Most of the Post Keynesian advocates would stress the role of institutions such as trade unions and monopoly power. What is of interest to us here is their explanations and recommendations for inflation, unemployment and economic growth.(38)

Post Keynesians reject the idea that inflation is a monetary phenomenon either in the short or the long-run. They reverse the alleged Monetarist causality between the growth in the money supply and in the price level. Post Keynesians argue that it is the pressures in the real sector of the economy that put pressures on the government to supply more money.(39) The real pressures on the price level are related to the institutional structure of modern capitalism. There are two important factors that affect the price

(35) This is not a criticism but has been recognized by the members of the schools themselves that their message has not been clear; see the Preface in Eichner(1979).

(36) The Post Keynesian school is based on the writings of J. Keynes, M. Kalecki, J. Robinson, P. Sraffa, R. Harrod, E. Domar, N. Kaldor, S. Weintraub, L. Passinetti, A.S. Eichner, and J.A. Kregel; see Eichner and Kregel(1975) and for a diagrammatic exposition Lianos(1983-84). Two journals are specializing in the Post Keynesian approach, namely The Journal of Post Keynesian Economics and the Journal of Economic Issues.

(37) However, their views differ from Keynes in a number of issues, the most important one being the income distribution theory; see Nell(1978).

(38) Other elements of the Post Keynesian approach are explained in Eichner and Kregel(1975), Eichner(1979) and Sawyer(1982, ch. 5 and 6).

(39) See Kaldor(1983, pp. 42-43).

level. First, the rate of growth of money wages relative to productivity growth.(40) It is argued that if money wages are growing faster than productivity, then upward pressure is put on the price level. However, this can be considered as a necessary condition for inflation, not a sufficient one. The sufficient condition is given by the second factor, which is the monopolistic power of the modern capitalist firms and the Post Keynesian theory of mark-up pricing. It is argued that firms are able to pass the additional wage cost to consumers, thus contributing to price level increases. This is sufficient, because if firms were unable to increase the prices of their product, then an increase in money wages would be absorbed by a decrease in profits.(41)

What is the Post Keynesian solution to inflation? The Post Keynesian policy recommendations are conditioned by the explanation previously examined. Peterson(1984) has suggested incomes policies as a remedy for inflation, which implies no institutional changes. Controlling money wage increases is one solution. However, in the long-run they would favour institutional changes such as nationalization, as Kaldor(1983) proposes or the need for a new 'social contract' between trade unions and monopoly powers, as Peterson(1984) proposes. However, they do accept that decreasing money supply growth brings down inflation albeit at the cost of an economic crisis.(42)

(40) See Moore(1979, pp. 130-134).

(41) The relation between profits and wages is the result of Kaldor's(1956) and Robinson's(1956) analysis; see also the survey by Eichner and Kregel(1975).

(42) See Fazzari and Minsky(1984) and Seidman(1983).

The Post Keynesian explanation of the unemployment problem is based upon their analysis of the macrodynamics of capitalism. It is their view, that the capitalist system is continuously in a stage of disequilibrium.(43) They view the private sector as incapable of fully utilizing the existing labor power and to this extent fully utilizing capital. They hold responsible not only the private sector's investment behaviour, but also the institutional structure as well.(44) They seem to believe in the trade-off between inflation and unemployment, particularly when controlling the money supply growth is used to achieve price stability.(45) Dampening inflation through monetary restraint results in a higher unemployment rate.(46)

What are the Post Keynesian remedies to the unemployment problem? Their views range from simple expansionary fiscal and monetary policies (Cornwall (1979)), expansionary fiscal and monetary policies accompanied by 'socialization' of investment (Arestis and Driver (1983), and Minsky (1983)), to nationalization proposed by Kaldor(1983) and Kalecki(1944). The most coherent policies for full employment have been proposed by Kalecki(1944). It is Kalecki's views which, in one way or another, reappear in Post Keynesian writings. These policies represent the views of the entire school. Kalecki proposed a number of policies to cure unemployment. First, he favoured public investment in building infrastructure, such as schools, hospitals, and highways. Second, he proposed indirect policies to increase private consumption, i.e., family allowances.

(43) A rigorous analysis of unemployment in the context of disequilibrium is given by Malinvaud(1977), though Malinvaud would generally not be classified as a Post Keynesian.

(44) See Marshall(1984).

(45) For an opposite view, see Cornwall(1981).

(46) See Kaldor(1983) and Cornwall(1979).

Third, he favoured redistribution of income from rich to poor which increases total aggregate demand. Fourth, he encouraged policies to increase private investment, i.e., lowering the interest rate. The last policy was not considered as effective and this reflects the views of the Post Keynesian school on the ability of the private sector to generate full employment. Kalecki(1944) explicitly advocated the regulation of private investment and the formation of public enterprises as part of a policy for full employment.

The area where Post Keynesians have made great contributions is economic growth. Their interest in business cycles and the instability of the private sector made their analysis dynamic and relevant to the long-run course of the economy. Their interest in the accumulation process and economic fluctuations has led their discussions into the fields of uncertainty and historical time.(47) Their theory of economic growth and business fluctuations is based on three basic postulates. First, it is recognized that investment in new capital stimulates economic growth. However, investment depends very much on the ability of an economy to save, which creates a link between income distribution and growth. It is assumed that profit-income is invested while wage-income is spent for current consumption. This leads to the conclusion that the share of profits to income is equal to the share of investment to income. At the aggregate level ex post investment should be equal to ex post savings. However, this is more than an equilibrium condition. The Post Keynesian theory asserts that investment is the driving force behind economic growth. Savings simply adjust to whatever the

(47) See Moore(1979).

investment level is. Thus, investment behaviour becomes the source of any economic fluctuations in a mixed economy.

But what are the factors that affect investment behaviour? Post Keynesian theory is not in accord as to what these are. They certainly reject the neoclassical approach.(48) Kalecki, writing in 1933, made the demand for new capital a function of profits, an approach due to his Marxian background.(49) Eichner and Kregel(1975) have argued that the Post Keynesian theory of investment can be consistent with any approach except the neoclassical one.

The second postulate of the Post Keynesian theory of economic growth is the 'warranted' growth rate of the Harrod-Domar model.(50) This rate is defined as the rate of the marginal propensity to save over the capital-output ratio. If the economy grows at this particular rate, then the ex ante expectations of investors are realized and capital is fully utilized. The third element in the Post Keynesian analysis of the business cycle relates to the potential rate of growth of output. It is defined as the level of output growth which is compatible with the full utilization of the economy's resources. The 'warranted', the potential, and the actual rate of growth determine different economic states. In case where all three are equal, the economy has achieved what Joan Robinson called a 'Golden Age'. However, even in this case, capitalism is not free from economic crises. If there is pressure to change the shares of income between profits and wages, inflation might become a problem. If the potential growth rate of output is higher than the other two, then

(48) See Eichner and Kregel(1975, p. 1302).

(49) See Kalecki(1966).

(50) See Branson(1979, ch. 21).

the result is an underutilization of the economy's resources. On the other hand, if the 'warranted' rate exceeds the potential growth rate, economic stagnation occurs. The existing capacity of the economy cannot sustain a higher rate of growth which is required by the 'warranted' rate of growth for equilibrium.

What are the policy implications of all these? Why should the policy-makers be concerned with the various growth rates? What can policy-makers do to achieve the 'Golden Age'? To answer these questions, one has to distinguish between the short-run and the long-run analysis of the Post Keynesian school. Since macroeconomic policy deals with the short-run, we focus on this aspect. In the short-run policy-makers can make sure that the savings rate keeps pace with the investment rate. The policy recommendation for economic growth appears to be an increase in investment. The instruments used to achieve this increase in investment are the ones recommended by Kalecki(1944), which were previously examined.

To recapitulate, the Post Keynesian approach appears as a challenge to the neoclassical macroeconomic synthesis at both the theoretical and the policy levels. Their views on inflation, unemployment and economic growth are diametrically different from the Keynesian, the Monetarist, and the New Classical. However, they are related to the Keynesian approach in that they favour government intervention using fiscal and monetary policy and incomes policies but they go even further to suggest more government intervention, particularly in the investment area.

Conclusions

The macroeconomic schools examined in this chapter have certain implications regarding the effects of economic policy. However, their analysis assumes a restricted role for government economic intervention. The conclusions reached appear to be relevant to the entire spectrum of government interventions but these are not supported by the specific analysis of each macroeconomic school. Their theories of macroeconomic policy are limited in a number of ways that can be summarized as follows (in brackets we give the chapter that we examine these issues):

- (i) All schools have ignored the motives behind any state economic intervention including macroeconomic policy (chapter 2).
- (ii) No theory of macroeconomic policy has systematically examined the full extent of government intervention (chapter 5).
- (iii) There is a bias in discussing only demand management policies and not other policies (chapter 3).
- (iv) Recent discussions on supply-side economics have failed to incorporate all the possible supply management policies (chapter 3).
- (v) No economic school has distinguished between direct and indirect government interventions for macroeconomic policy purposes (chapter 3).
- (vi) The conclusions reached by the alternative schools on the effectiveness of government economic interventions are applicable only to one type of policy (chapter 4).

The purpose of the remainder of this part of our study (chapters 2-5) is to develop a theory of macroeconomic policy which will take into account all the above limitations. In the second part (chapters 6-11) we develop an econometric model for Canada that shows how in practice some important types of government interventions can be used for macroeconomic policy.

CHAPTER TWO

THE STATE IN MIXED ECONOMIES

Introduction

The theory of economic policy has not fully analyzed the role of the state. Indeed, some economists have argued that their analysis of the state falls outside the scope of economic research, i.e., it is the subject matter of political science. This view has considerably underestimated the role of the state as an economic actor whose decisions are shaped by the particular economic environment.⁽¹⁾ Economic analysis has focused its attention on the economic activities of the private sector, but in modern societies the economies are mixed; the economic activities of the private sector and the public sector are interdependent and in most cases complement each other.

The economic behaviour of the private producers is determined by the profit motive. On the other hand, the state's economic activities are motivated by more complicated incentives. These are examined in this chapter. They can be generalized under two broad categories: social stability and capital accumulation. It is the goal of the state to preserve the social integrity from any internal and external threat. It is also its 'duty' to secure a normal rate of capital

(1) We should note here that at the microeconomic level the role of the state has been taken into account (see Alt and Chrystal (1983), chapter 8). For example, Baumol in his 1967 model explicitly distinguishes between two sectors: industrial and government. However, his model was to compare the productivity of the two types of production and not to evaluate the macroeconomic policy consequences of the two types of production. Throughout this study we assume that state production is as productive as private production.

accumulation. In addition, the state is required to legitimize its own existence versus the alternative of anarchy (a stateless society) or the alternative of a different type of state, i.e. a centrally planned state as opposed to a laissez faire state.

Government expenditures and taxes are the economic lever through which the state can perform its multidimensional and sometimes contradictory role. Thus, the various state economic functions are determined by the above-mentioned general concerns. In this sense state spending is completely endogenously determined. Government expenditures are used in such a way as to satisfy the various concerns of the state.

In this chapter we examine the economic policy role of the state, using a theory of the state based on class analysis as this has been developed by Miliband(1983 and 1986), Poulantzas(1978) and Resnick and Wolff(1983). A first attempt to apply this theory of the state to economic analysis has been the work by Williams(1982). This chapter is divided into three sections. In the first, various concepts are examined such as power, state, government, public interest, and popular policies. The second section analyzes the scope of state economic intervention in mixed economies. The final section presents the role of economic policy in meeting the general goals of social stability and capital accumulation. It is these two concerns that determine the supply of economic policy.

1. Power and Economic Policy

Economic policy is undertaken by social as opposed to private agents. There are many institutions which are involved in the making of macroeconomic policies. In the literature of the theory of economic policy, all these agents are integrated into one and are called policy-makers. The various institutions need not have the same goals or responsibilities. Policy in societies with mixed economies is decided and carried out by the state, the bureaucracy and the government. The three might not exist harmoniously and everything depends on the relative power that each institution has acquired. Before we examine the provision of economic policy by these public institutions we should discuss the concepts involved such as power, state, government, popular and unpopular policies.

The most important distinction for our purposes is the one we make between private and public. The first has been well analyzed by economic theory; the latter has received relatively little attention, particularly from an economic policy perspective. The concept 'public' cannot be defined by aggregating private units for the simple reason that individuals do not have homogenous interests. What is good for one particular individual or one group of individuals may not be good for another group or the society as a whole.(2) The pursuit of one's self-interest may not lead to the general good as

(2) The invisible hand approach asserts exactly the opposite: each individual pursuing her own interest contributes to society's welfare. Suppose that a worker by pursuing her own interest asks for a higher wage by participating in a trade union. This is good for her but bad for the owner of the firm and nothing can be said about society's welfare.

the proponents of *laissez faire* assume.(3) The reason is that there are diverging interests within society. Thus, a simple aggregation of private interests will not suffice as a definition of the 'public interest' term, a concept used frequently in the policy literature.

Macroeconomic policy is applied in the name of the public interest even though the latter is not defined.(4) Implicitly, it is assumed that economic policy is beneficial to society as whole, which presupposes that there is no conflict between the various social groups. Even worse, it is assumed that society is not divided at all along class lines. But at the same time, the literature on economic policy and the media distinguish between popular and unpopular policies. If policies are unpopular, why are they applied? Does this imply that some policies are good for society but not for the individual? And if this is not so, why then cannot the individuals perceive their own interests? Are they irrational? But irrational behaviour is not an assumption economists would favour. Either the individuals are irrational or the existence of the so-called unpopular policies demonstrates that there is no such thing as the

(3) Adam Smith in his Wealth of Nations assumed perfect competition (and not monopolies) as a sufficient condition for the 'invisible hand' to work. Karl Marx in his writings has argued perfect competition leads to concentration of capital and therefore monopolies.

(4) At the microeconomic level, the Paretian principle (see Ng(1983, p. 30-32) of making someone better off without making someone else worse off (with or without compensation) has been applied to evaluate public policy, particularly economic regulation. However, most of macroeconomic policies involve situations of conflict (someone is made better off at the expense someone else being made worse off), which are Pareto-noncomparable states (see Just, Hueth and Scmitz(1982, p. 16-17)). At the macroeconomic level, Lipsey (1965) has incorporated a social welfare function to evaluate policy-makers' choices between inflation and unemployment, which it may be interpreted as 'conflict' situations.

public interest.(5) We are left with no other choice but to admit that society is divided between different classes or groups of individuals.(6) Each social group has similar interests in a particular set of policies applied by the policy authorities. These groups behave very rationally in pursuing their own interests but in most cases these interests might be in conflict.(7) Thus, a policy may be unpopular (not wanted) with regards to a group of individuals such as workers but popular for another group, such as capitalists. The problem is to determine which of the various interests dominate and why. This brings us to the scope of the state, but first we should define the concept of the state.

The state is a social (and not a natural) institution and it emerged because certain human problems can not be solved by individual actions alone. One of the problems that the modern state has to deal with is the social phenomenon that conventional economists want consciously or unconsciously to conceal, namely class conflict. After all, if there were no opposing interests, there would be no need for state action and therefore no need for economic policy. Thus, class conflict creates the need for economic policy. The state emerged to mitigate the antagonistic interests of the

(5) A distinction between current and future generations might also explain why policies pursued in the name of public interest are unpopular. In this context, policies are not only implemented to benefit the current generation but future generations as well. It might then be the case that these policies are unpopular to the current generation but they are of benefit to the future generation.

(6) This might be one reason which explains why conventional economists are very reluctant to analyze in depth the state's economic role. They refuse to recognize that there are divisions in society based upon purely economic matters.

(7) The new developments in public finance (the public choice school) recognizes the existence of different interest groups with opposing interests. This conflict of interests is held responsible for the increase in the government size; see Mueller and Murrell(1985).

various fragments of society. Since it is a man-made institution, the state supports and is supported by those that favour the extent of its existence.

The most important problem the state faces is to get support for its existence from the majority of the population. The legitimacy of the state can be achieved using three sources of power that the modern state has at its disposal: (i) Coercive power, (ii) Compensatory power and (iii) Conventional power.(8) Modern states use all three powers to legitimize their existence. The first involves the use of force to 'persuade' individuals to behave according to the will of the state. The right to use force has become the monopoly of the state. However, the importance of coercive power has been diminishing and has limited application in advanced countries with mixed economies, i.e., the so-called Western democracies.

The other two types of power, compensatory and conditional, are the most important ones and particularly relevant to modern societies. Compensatory power is established when various individuals or social groups accept the power of the state in return for material gains. Conditional power is the result of persuasion with such means as formal education and mass media. It is the most important method to propagate such ideas as private property, social responsibility, free exchange, individualism, etc. If it is successful, conditional power is the most effective of all because it requires the minimum administration cost.

All three types of power are used by the state in implementing

(8) See Galbraith(1983, ch. 2 and 3).

economic policies. As we said above, the most effective power is the conditional one but applying economic policies can be more effective if compensatory power is applied. For example, tax-based income policies are the hardest to implement, i.e., they have high administration costs. These policies should rely on compensatory power, i.e., tax those that do not follow the price-wage guidelines and subsidize those that do. Compensatory power becomes more relevant to economic policy because the private sector can look at its interaction with the public as a cost-profit relation and take this into account when major economic decisions are taken that will affect the entire economy. Condign power can be used as well in order to influence the behaviour of individuals in a way that is consistent with the goals of economic policy. It is very common in many countries to have material as well as physical punishment (incarceration) if economic rules, such as avoiding overpricing or black market activities, are not obeyed.

So far we have mentioned only the state as the only institution that decides and implements economic policies. However, in the literature of economic policy other terms are also used, such as government and bureaucracy. Are these different? The answer is yes: The state is a broader term and includes the government, the administrative bureaucracy and other institutions, such as public enterprises. Changing the government, a common feature of Western societies, does not necessarily imply a change in the bureaucracy or in other institutions that constitute the state apparatus. The government is responsible for formulating and deciding on certain policies, while the other state institutions are responsible for implementing them. The government is supposed to be in charge of the

state apparatus but this does not mean that it can change it drastically.

We consider the state as the most important concept in the theory of economic policy. The reason is that what is important in such a practical field as economic policy is the analysis of those factors that make certain theoretical alternatives possible which are easy to implement. The theory becomes important in persuading the government or the political party to accept a particular policy as its economic strategy. The implementation part becomes very important because bureaucrats have to be convinced of the applicability of a particular policy. This is the reason why governments with large bureaucracies, such as in France, are not always able to implement policies that are drastically different from what was the practice before. It is also why, when we refer to policy-makers later on, we mean the entire state, which of course includes the government.

2. The Scope of State Economic Intervention

The most important goal of any authority is to rationalize and justify its own existence. The use of any type or combination of powers is necessary for any legitimization, including that of the state. Legitimization is independent of the socioeconomic system. It is more important for those societies which have strong state intervention, which includes economic intervention. The legitimization process is associated with two types of problems. First, the state has to justify its existence versus its non-existence (anarchism). Second, the state has to rationalize a particular type of state such as capitalist versus socialist, a welfare state versus a liberal state, democratic versus authoritarian one, etc. The argument for anarchism has received little support and this is the reason we do not further discuss it. What is of interest is the second type of problem that states face, i.e., legitimizing a particular type of state involvement within the context of mixed economies.

The liberal approach developed by Adam Smith in 1776 argued for limited state intervention. According to Smith, the state should restrict its activities to only three duties: external protection, internal protection, and economic activities (public works) that the private sector cannot undertake because they do not earn profits. But those that refer to the father of economic science for support of their laissez-faire arguments have not appreciated the extent of state economic intervention that Smith's duties of the state

permit.(8) The third duty may allow for an active state economic intervention, particularly in periods of economic crises when many private economic activities become unprofitable.(9) In addition, there has been a growing number of new industries that the private sector finds unprofitable or too risky to undertake such as telecommunications, railroads, banking services, insurance, etc. Thus, Smith's limited state might allow for larger state intervention than what the modern advocates of laissez faire are willing to accept.

The liberals of the previous century and the conservatives of our time aim at minimizing the economic role of the state, i.e., Smith's third duty of the state. Their argument for a limited state is based on their belief about the capabilities of the private sector. It is believed that the private sector, if left alone, can achieve the best economic result possible for the entire society. This view is shared by many economists since Smith advocated it two centuries ago.(10)

The view for limited state economic intervention (the liberal-democratic approach) has been shattered by the apparent failure of the private sector to deliver what was considered as best for society. This became more evident during the 1920's and the 1930's when harsh economic crises undermined the economies of Western societies. A number of economists started to question the ability of

(8) Smith himself could not have anticipated that the duties of the state may involve a strong state economic intervention. This is particularly true for the third duty, i.e., the unprofitable economic activities.

(9) In the literature of public enterprises this has been considered as one of the main reasons for government economic intervention in the advanced countries with mixed economies.

(10) The Austrian school (see von Mises(1920), Hayek(1944) and Schumpeter(1942)) supported this view early in this century.

the invisible hand to produce results that were considered optimal.(11) Those economists that still support a limited economic role for the state have changed the tone of their arguments. Now a liberal-democratic state with limited government intervention is legitimized by the argument that although, the private sector may not produce the best results, the state intervention will be worse.(12)

The most important challenge to the view of limited state economic intervention comes from the supporters of a welfare state. Keynesians (including Keynes himself) have supported an active state economic role, particularly at the macroeconomic level. Their argument is that the private sector, as necessary though it is, requires direction so that problems such as unemployment can be avoided. Another support for an active state economic role comes from microeconomic theorists who claim that for various reasons such as natural monopolies, externalities, transaction costs, asymmetric information, etc., the market mechanism is unable to produce efficiently or to produce at all. In most of these cases the solution proposed is for state actions to regulate the course of private economic activities because they claim that there is a divergence between the private and the social benefits.

The two views of a liberal-democratic state and a welfare state have dominated the debates on government intervention, particularly in the period after the last world war. During this period the state

(11) Keynes(1937) has argued that laissez faire was outdated.

(12) We have in mind studies by M. Friedman(1962 and 1980). For example, Friedman and Schwartz(1986, p. 39) have argued that '...the market failures...attributed to a strictly laissez-faire policy...encouraged the view that turning to government as an alternative was a cure that was worse than the disease...Government failure might be worse than market failure.'

economic role has been increasing in a systematic way in both absolute and relative terms. However, both views accept the role of the private sector as beneficial to society and by no means want it abolished. In other words, both approaches legitimize a different type of a state within the boundaries of the private sector.

The governments of countries with advanced mixed economies have taken different courses of action but have never questioned the existence of the private sector. The political parties that have adopted either the liberal-democratic approach or the welfare one have never questioned the role of the private sector in the capital accumulation process. Thus, no matter what type of state each country adopts in the advanced capitalist societies, their governments have legitimized the existing social system. The state's role can be only understood if this need to legitimize the accumulation for profits is taken into account. This is particularly true for state economic intervention.

The state's general economic involvement has two purposes. First, it attempts to provide social stability.⁽¹³⁾ Second, state economic intervention has to serve the interests of the dominant class or the classes which it represents. In the case of the capitalist economies, the state's economic role has to ensure that the capital accumulation for profits is not undermined. This is a service not to the individual capitalist, but to the capitalist class as a whole. Thus, it is not at all contradictory to see state economic actions in opposition to the economic interests of a segment of the capitalist

(13) Smith's first two duties of internal and external defence can be considered as part of the general purpose of social stability.

class. As we shall see, it is not surprising that state economic actions oppose the entire capitalist class, but are taken to support the capitalist system.

Social stability is the goal of any state, but private capital accumulation is within the interests of the capitalist state alone. Thus, the various forms that the state takes in different periods of time in a number of countries can be explained by the level of capital accumulation and social coherence. For example, the welfare state becomes very important in a situation where social stability is threatened. This appeared to be the case in many advanced countries in Western Europe after the Second World War. We are going to examine these two purposes in detail because they are very important in understanding the apparent neutrality of the state and its relation to various state economic interventions in mixed economies.(14)

Social stability requires that the opposing groups in society accept the existing relations of production. It also requires that the existing social order is not undermined by external intervention.(15) As we have already seen, society is divided into different social classes with conflicting interests. The dominant interests are the economic ones but non-economic interests can become

(14) This apparent neutrality of the state has been the main reason why writers from the new left have argued that the state is an autonomous social category: see Poulantzas(1969, 1973) and Miliband(1969).

(15) There has been a great debate in radical literature on the causes of the transition from one mode of production to another. Some stress the class conflict factor, which implies that some classes do not accept the existing relations of production; others emphasize the external influences that destroy the existing social order: see the synthesis by Gottlieb(1984).

important, such as cultural, religious and language differences.

In a capitalist society the interests of capitalists and workers are the most important in terms of the conflict they generate. Capital-labor relations have become an everyday issue in the advanced capitalist countries because they directly affect the economy. Unfortunately, economic policy has completely ignored these relations.(16) Social stability in a capitalist society requires that all opposing groups accept the capitalist mode of production. Nowhere in the capitalist world has organized capital argued against the capitalist mode of production, which is not the case with labor. Labor has to be persuaded to accept capitalism.(17) Thus, one of the state's roles is to make sure that labor's demands are satisfied so that the stability of the system is not undermined. In other words, internal stability requires that labor is contained. This depends on a number of factors including the power of organized labor and the political circumstances. The economic factors are very important. Relatively high labor wages make the opportunity cost of any 'revolution' to change the system very high.

The other purpose of the state is to facilitate private capital accumulation. Production for profits is what distinguishes capitalism from other modes of production.(18) Profits are what sustains private capital accumulation. Capital accumulation is the most important

(16) As was shown in the previous chapter, this is not true for the Post Keynesian school but its influence has been limited.

(17) The word accept may imply that workers are somehow forced to live with capitalism. This is not at all true, since force as we have already seen is only one way to apply power; compensatory or conditional power can be applied with effective results.

(18) This is not to imply that other modes of production do not produce for profits but it is not dominant. Under capitalism an increasing number of goods have become commodities.

economic function of any social system. No economic system has solved the scarcity problem. There is always a need for more output to satisfy the unsatiated consumption of society. One way to produce more is through capital accumulation, which includes technological advancement. Capital accumulation can take place under different arrangements. In a private economy the motive is higher profits. These profits accrue to capital owners. The higher the rate of profit, the higher the accumulation of capital, the higher the capacity of the society to produce more goods.(19)

The state's task is to ensure that the rate of profit is relatively high. This guarantees a minimum of private capital accumulation, and, therefore, the perpetuation of the capitalist mode of production. The state provides the institutional complex that the private sector can work in. It conducts economic and non-economic policies which secure a relatively high rate of profit. Thus, state actions cannot be a substitute for private economic activities. On the contrary, they are complementary and are necessary for the existence of the capitalist mode of production.

We have seen that Adam Smith allowed the state to undertake non-profitable economic activities. If the state does not support capital, it will undertake profitable activities as well. But this has not proven to be the case. Nationalization in capitalist societies is primarily the last resort for bankrupt private enterprises. Other state activities, direct and indirect, are

(19) The relation between the rate of profit and capital accumulation has been examined by Sweezy(1942, chs 5 and 6), Desai(1979, ch. 18) and Hunt and Sherman(1981, ch. 32). The relation between capital accumulation and the wage rate is analyzed by Erdos(1982, ch. 8).

undertaken in order to support capital. It is not surprising that capital in many cases asks for state intervention to support a higher rate of profit. It is very difficult to imagine a modern society without active state intervention. The private mode of production would collapse if the state ceased to intervene in the economy. In other words, the stability of the capitalist system is at risk. Keynes was well aware of this fact of capitalism when he was advocated government intervention.(20)

In brief, the state in a capitalist economy has two tasks to perform: internal stability and the assurance of a certain level of private capital accumulation (a certain level of profits). Since the state pursues these two goals simultaneously, it is interesting to see how these two tasks are related. The existence of modern capitalism depends very much on the ability of the system to reproduce the labor power and the capitalist relations of production. Both are ensured at an increasing rate by the state. For example, the reproduction of labor power requires such things as housing, education, health and family planning. All these have been increasingly undertaken by the state in many Western societies. This involves increasing state intervention and therefore a relative shrinking of the private sector. This is the general problem of capitalism. As the state sector grows, either for social stability purposes or capital accumulation purposes, the relative size of the private sector may decrease.

(20) Keynes(1937, p. 65) has argued that "... it is a general conviction that the stability of our institutions absolutely requires a resolute attempt to apply what perhaps we know to preventing the recurrence of another steep descent"(emphasis is mine).

State involvement for one purpose may undermine the achievement for another.(21) For example, measures for social stability, such as unemployment insurance, increase the cost of labor. The former is good for social stability, the latter is an impediment to capital accumulation because it reduces profits. This contradiction in state intervention is true for all government actions and poses the biggest problem that modern capitalist states have to solve. Thus, measures that the state takes for social stability appear to be against the capitalist accumulation but not against the capitalist system. On the contrary, such measures are necessary for the existence of the capitalist system. On the other hand, measures that support capital accumulation for profits such as immigration policies may endanger the social stability of the capitalist system either for economic reasons (reduction of wages) or non-economic reasons, such as racism.

The capitalist state has the enormous task to reconcile these two opposing needs of the capitalist system. How can the state achieve these two goals? What alternative roles can it play? The state's role can either be passive or active. The passive role is identified with the liberal-democratic approach, which restricts the role of the state so that it reacts to economic circumstances shaped by the unconstrained operation of the private sector. An active state is advocated by the social-democratic approach, which allows for a strong state which shapes the economic circumstances and sets the

(21) J. O'Connor(1973, p. 6) in an important book, The Fiscal Crisis of the State, starts his analysis of government sector with the same basic assumptions: "Our first premise is that the capitalistic state must try to fulfill two basic and often mutually contradictory functions - accumulation and legitimization." (emphasis in the original).

rules under which the private sector can operate.(22)

The distinction between an active and passive state is fundamental in understanding the policy role of modern states. A liberal-democratic state implies weak (indirect) government intervention. A social-democratic state aims at a more stronger (direct) effect on the economy. The indirect-direct effects become very important in our classification of alternative economic policies presented in the next chapter. In the following section we examine the provision of economic policies by the state.

3. The Making of Economic Policy

In the last section we have seen that the scope of the capitalist state is to ensure social stability and a 'normal' rate of capital accumulation. For our purposes it is important to show how economic policy can contribute to the achievement of both purposes of the state. In this case, economic policy is viewed as a tool to achieve state's goals.

Economic policy can be considered as a service which is the monopoly of the state. In other words, it can be considered as a public good.(23) Economic policy is decided by the government but is implemented by the bureaucracy and other elements of the state apparatus, i.e., public enterprises. It can be considered as the most important state activity during peacetime. In the recent past (after

(22) These two alternatives with reference to the Western European tradition are discussed in R. Scase(1980).

(23) M.S. Wallace(1983) examines economic policy as a public good.

the Second World War), economic policy issues have dominated the news of most countries with mixed economies. Elections, more than ever before, are fought on economic issues. This has given rise to a new type of economic fluctuations, namely the political business cycle.(24) It is argued that a newly elected government will undertake unpopular policies while a government which faces elections will shift to policies that are popular.

The political business cycle as a theory of supply of economic policies fails on two grounds. First, it has to assume that the electorate has no political memory and therefore it can be easily fooled.(25) This assumption of non-rational individuals is not very popular among economists. Second, the definition of popular and unpopular policies is not very clear. There is no such thing as popular or unpopular policies. There are simply policies supplied by the state which benefit the majority of the population and policies that benefit the minority. If the division of capitalist society into workers and capitalists makes sense, then policies that favour workers (the majority) can be considered popular while policies that favour capitalist can be considered unpopular.(26) If the goal of the government is to secure re-election, then it should carry out policies that favour the majority of the population.(27) This should occur during the entire period that the government is in power, but does not. The political business cycle theory has some empirical

(24) The political business cycle idea is discussed in Alt and Chrystal(1983, ch. 5).

(25) See Frey(1983, p. 11).

(26) A good example is income policies that can be used to favour wage earners or profit earners.

(27) We assume that there are no policies that can favour the entire population or there are very few and really unimportant.

support. However, the 'fact' of a shift in the type of policies (popular or unpopular) can be explained otherwise. Assuming that the state in mixed economies is a capitalist state, which implies that it supports and is supported by the capitalist class, then the making of economic policies can be explained in terms of the state's goal to benefit capital. In the post-election period the government implements policies that support capital since there is not an immediate threat to social stability (at least through elections). This is true only if workers have been persuaded that politico-economic changes should be made by the democratic process of elections. If this is not the case, then the state can use other types of power such as condign power. For the moment it appears that the advanced countries with mixed economies have succeeded in achieving a social consensus of how changes can be made.(28)

Thus, policies to support capital are by definition unpopular because the capitalist class constitutes the minority of the population. On the other hand, towards the end of the legislative period the government supplies economic policies that are considered popular because they benefit the majority of the population. Since the majority of the population are income earners (workers), these policies benefit labor and therefore social stability is preserved. Thus, workers vote for bourgeois parties, i.e., parties that support capital accumulation for profits.(29)

(28) This is not the case for the less developed countries but they are beyond the scope of our study.

(29) A careful reader will notice that even this explanation we suggest assumes some sort of political illusion on behalf of workers in voting for bourgeois parties. There are many reasons that can explain why workers rationally do not vote for workers' parties. First, workers are not a complete homogeneous group relative to capitalists so that united actions are not always possible. Second,

The supply of economic policies in this way has been the case for most countries with advanced mixed economies after the Second World War. However, it was a relatively easy task because this period was characterized by relatively stable economic growth.(30) The relatively stable economic growth was the result of three factors. First, a relative shortage in the supply of labor because of the sacrifices due to the war. Second, the decrease in the capital stock, and third, and may be most important, a new, more direct state economic role. The first two kept the rate of profit at high levels, at least up to the 1970s, while the state's role was very important in the process of profit realization by creating effective demand.(31)

The reason why economic policy changes so frequently can only be explained by the level of conflict between the two important classes, capitalist and labor. Economic policy has become very important in the attempt to balance the need for capital accumulation by the private sector and the need for social stability. Since the state has a third task, that is to legitimize its own existence as a neutral institution, these policies are presented as benefiting the society

their large numbers may make a unanimous decision impossible. Third, workers can be considered as risk averse, which makes them very reluctant to vote for parties that promise big social changes. Fourth, in advanced mixed economies the opportunity cost of a revolution for workers is very large because they have relatively achieved high standards of living.

(30) This is relative to what was the case before the Second World War. The influence of Keynesian policies can be credited for the post-war stability. However, Romer(1986) has suggested that the stabilization of the postwar economy has been a 'figment of the data'.

(31) A classical analysis of this theory is given by Sweezy(1942). The macroeconomic implications are examined by Sherman and Evans(1984, chapter 14), particularly the appendix 14A where they present a simple macroeconomic model to explain business cycles.

as a whole and therefore both groups.

Conclusions

In this chapter an attempt was made to explain the behaviour of the state in societies with mixed economies. We emphasized the policy aspects of government actions but other areas were also examined. It was argued that the state in capitalist economies has a threefold role to play. First, it legitimizes its own existence. Second, it has to contribute to social stability and, third, it has to ensure a minimum level of capital accumulation for profits.

The state can achieve all the above three goals using the powers that it has: compensatory, conditional and condign power. Economic policy becomes just another tool that is used to meet the general goals of the state. Economic policy can be applied, using any type of power which is at state's disposition. In the advanced countries with mixed economies, conditional power and particularly compensatory power have been used at an increasing rate.

C H A P T E R T H R E E

THE THEORY OF ECONOMIC POLICY

Introduction

The title of this chapter is borrowed from a relatively small book written in 1952 by Jan Tinbergen, which has become a classic in its field. His study contributed to the theory of economic policy and its applications. Tinbergen used actual data to demonstrate the effects of government economic policies. Since then, a number of works have appeared which expanded the theory of economic policy.(1) However, Tinbergen's initial concepts remain intact.(2) Later contributions added little to the theory of economic policy as developed by Jan Tinbergen.

This chapter attempts to contribute to the theory of economic policy by generalizing and classifying the alternative policies which can be pursued by the government. We do not offer new policies, but present the entire spectrum of government economic activities in a new systematic classification. The alternative policies can be easily seen as well as the area of the economy at which they aim. We hope that this will provide a better understanding of what the government is doing, how it is doing it,

(1) The inclusion of uncertainty by Brainard(1967), the mixed policy by Poole(1970), and the generalization of Fox et al.(1973) are some of the contributions in this direction.

(2) Concepts such as targets, instruments and data were explained by Tinbergen. Also, the idea that the government attempts to maximize a social welfare function, which he calls a collective ophelimity function, is explained in the original 1952 book. A generalization of Tinbergen's static model to include dynamic analysis is given by Preston and Pagan(1982).

what it can do, and how it can do it.

This chapter deals with the economic nature of policy-making and thus leaves unexamined the political aspects of each policy measure. There are political costs and benefits associated with each policy, but our assumption is that the government is able to implement any policy. The only criterion is the economic one. This is an unrealistic assumption but it is consistent with a time-honoured tradition in economics of not interfering with political process. This approach is followed here but for a completely different reason. We do not believe that one can have a thorough understanding of economic policy matters by separating economics from politics. But we do believe that one should first examine what economics has to offer and then proceed to discuss the political aspects.

In our approach we attempt to contribute only to the economic aspects of policy-making. In this sense our analysis is incomplete since it omits the political aspects of policy-making. The interdependence of economic policies and politics can be demonstrated by the fact that the implementation of a new economic policy may require social and political change. Kalecki(1943) was very critical in that respect. He claimed that full employment as a target of economic policy is conditioned by the development of new political and social institutions. This is true for any policy measure but we will not go into depth on this issue.

This chapter is divided into three sections. In the first, we examine the objectives of policy-makers as these have been developed in the theory of economic policy. In the second section,

we examine the elements of economic policy which constitute the basic concepts in the theory of economic policy. In the third section, we present a new classification of economic policies.

1. The Objectives of Economic Policy

The most important goal of macroeconomic policy from its early conception has been full employment. The right of every individual to have a job has been recognized to be almost as fundamental as the right to liberty. There are many reasons to explain this 'bias' towards full employment and, basically, there are two types of arguments in favour of it. First, it has been argued, primarily by development economists, that full employment is a means to alleviate poverty - which is the ultimate objective of any economic activity. Second, unemployment is criticized on efficiency grounds because idle resources (in this case labor) are not fully utilized to produce the maximum level of output.

A certain level of unemployed workers is unavoidable in a market system due to frictions in the labor market. If this is true, why then so many governments have made elimination of unemployment their main economic policy objective?(5) We should note here that even economists believed that full employment can be attainable in a capitalist system.(6) Politicians accepted full

(5) This goal has been questioned whether it was ever a true target of policy making. In the context of the United States, the goal of full employment became a goal of maximum employment; see Wolfe(1981) and Peterson(1984).

(6) See Robinson and Wilkinson(1977)

employment as one of their economic goals. It began with the White Paper published by the British government on Employment Policy in 1944.(7) The reason is obvious when the historical socio-economic conditions in the 1930's and 1940's are taken into account.

The Great Depression in the 1930's proved that capitalism could not avoid major economic crises. The war gave working people the power to demand more from their governments. Furthermore, the existence of another social system, that of the Soviet Union, provided one possible alternative which haunted the minds of many politicians.(8) All these historical conditions forced the politicians either to accept, in appearance at least, the full employment objective or alternatively to deal with social unrest which might have undermined the existence of the capitalist system itself.

The second most important goal of macroeconomic policy has been the task for economic growth and development. Economic growth is defined as an increase in the level of output. Economic development involves all the structural changes necessary to achieve higher levels of wealth and is a more appropriate term to describe the economic situation of the less-developed countries. Is this goal a realistic one? The purpose of economic science itself is to explain the creation and the increase of wealth. One of the most influential books in economics had as its main

(7) See Tomlinson(1983). A number of other countries followed the British example (Canada in 1945 and the U.S. in 1946).

(8) As a matter of fact, Eastern European countries had the opposite problem to solve with their employment policy. They appear to have a shortage of labor, not a surplus. An evaluation of these policies is provided by Adam(1982).

objective to study the 'Wealth of Nations'. Another important book had in its title the factor that can contribute most in increasing wealth, namely 'capital'.

The most important feature of economic growth as a policy objective is that it can be compatible with any social system. The attempt for higher economic growth has been pursued by all countries, even though they are organized under different socioeconomic systems. This was not the case with full employment. The so-called socialist countries may have other economic problems but unemployment does not appear to be one of them.(9) Output maximization is, *ceteris paribus*, harmless for any social system. On the contrary, it can solve a number of other problems. This does not mean to imply that all social systems can cope with economic growth in the same way. It is interesting to note that economic growth can have detrimental effects in a capitalist economy. It is paradoxical that more output growth may not be desirable in a capitalist economy. The entire literature on economic growth aimed at achieving optimal (whatever that meant) levels of economic growth.(10) One aspect of the problem is that higher economic growth can be achieved by sacrificing current consumption for future consumption, i.e., the current generation for the next generation. This is true for any socioeconomic

(9) See Nove(1985).

(10) See Branson(1979, ch. 24). Economic growth involves higher level of output. An increase in the production of goods might not always be desirable, if they cannot be sold. Realizing profits by selling the commodities produced is a very important aspect of the capitalist economy; see Sweezy(1942). Even in non-capitalist modes of production, more economic growth may not be desirable because it might generate negative externalities, such as pollution.

system. Another aspect is that certain imbalances (bottlenecks) may arise. The latter is related to the argument of balanced growth and is of particular interest to less-developed countries.

Economic development as a policy goal is very common in less-developed countries. However, the advanced capitalist countries have similar problems as far as structural changes are concerned. The only difference is that the level of these changes is different. The advanced capitalist countries may call it industrial policy. Both economic development and industrial policy refer to structural changes, the first being between agriculture and industry, the latter between industries and the service sector.(11) The first refers to pre-industrial societies, the second to post-industrial societies.

Price stability has become an increasing concern of policy-makers in the 1970's and 1980's. Anti-inflation policies have been the main objective of economic policy in a number of advanced capitalist countries. Even though there are many theories and therefore policy recommendations about inflation, the cost of inflation is not sufficiently explained.(12) Undoubtedly, hyperinflation can undermine the existence of the capitalist system itself, a view held by Keynes(1920, p. 236). Hyperinflation creates uncertainty in the real rate of return on money and other financial assets. The real sector of the economy, as is manifested by the level of output, investment, and

(11) A recent discussion of industrial policy is given by Norton(1986).

(12) The theories of inflation with their relative policy recommendation are surveyed by Frisch(1983).

employment, may not be affected in the short-run as was the case in Germany in the 1920's. However, in the long-run the instability in the financial and money markets creates problems in the capital accumulation process. The reason is that the cost of holding money as this is given by the rate of inflation increases during periods of hyperinflation. At the extreme, when hyperinflation tends to infinity, nobody will hold money.(13)

If hyperinflation is an economic problem, a moderate inflation need not be one. It is not clear what the real cost of inflation is as long as it is kept below a given level, and its effect on wages and taxation are taken into account through indexation. The experience of the advanced countries in the 1970's shows that inflation rates below 20% did not stagnate the economy. Why then are policy-makers fighting to reduce inflation even below five percent?

To answer this question, one has first to answer the question of who benefits and who loses from a moderate rate of inflation. Minarik(1978) concluded that inflation adversely affects primarily the upper classes through the loss in the value of securities and bonds, higher real taxes and less dividends. Minarik has pointed out that in the 1970's the working class was able to catch up with inflation and even make real gains.(14) On the other hand, a low inflation rate policy through austerity measures hits primarily

(13) No evidence on infinite hyperinflation exists but the empirical evidence presented by Cagan(1956) on seven hyperinflations shows that real balances tend to fall during the entire period of the hyperinflation.

(14) A theoretical explanation of the distributional effects of inflation is given by S. Weintraub(1958, pp. 102-104).

the lower income groups by increasing the number of unemployed. This results in downward pressures on the real wage rate. It is not surprising that conservative governments pursue policies which aim at decreasing the inflation rate. Their argument is that decreasing the inflation rate will stabilize the value of the currency and this will increase investment.

Full employment, economic growth and price stability are the three most important objectives of macroeconomic policy which have been put forward by economists.(15) It is an assumption about the main goals of policy-makers. A number of other objectives can be added to the above list, which has been the concern of macroeconomic authorities. One of the most important is the increasing external debt for a number of countries, particularly after the energy crisis in the 1970's. This hit the less-developed countries hard but some countries in Western Europe have suffered as well. The external debt becomes an important constraint on financing national economic growth. Reducing the external debt is usually associated with high levels of unemployment and austerity measures which retard the growth of national output.

The last objective of economic policy that we examine is income distribution. This relates in one way or another to all economic policy objectives previously discussed. Short-run macroeconomic analysis never dealt directly with the issue of economic inequality, i.e., income distribution. This appears surprising because income distribution is related to important economic

(15) See Friedman(1968, p. 1)

variables such as investment, consumption, savings, and economic growth. However, the income distribution policy objective is related to the most important goal of the capitalist state, which is to facilitate capital accumulation subject to the constraint that the legitimacy of the system is not threatened.(16) Capital accumulation is the raison d'être of a capitalist society. Without accumulation the whole system is in a state of crisis. Capital accumulation is related to the profit and the wage rate. This constitutes a double relation. First, a higher profit rate facilitates the transformation of money into productive capital. In a more conventional terminology, this implies that savings are easily transformed into investment. Second, a higher wage rate facilitates the transformation of physical output into money (the realization of profits). In other words, capitalists have no problem in selling their output. There is no glut in the market. A low wage (profit) rate creates problems for the realization (investment) process.

The capitalist state through its macroeconomic policy wants to ensure that wages (profits) are kept at a level which does not create any problem. This is really an enormous task but it is something that the modern state has been pursuing consistently.

How are all the various objectives translated into a common goal of government economic policy? How are all these goals taken into account by the policy-makers? There is a need to evaluate the performance of policy-makers in terms of the actual behaviour of

(16) This was discussed in the previous chapter. The only thing we want to mention here is that this goal has not been part of the economists' list of policy objectives.

economic variables. The variables that are included in the government's list of interests are considered as the objectives of economic policy and are quantifiable in terms of predetermined targets. The evaluation of government economic policy can assume a very concrete form and the most common one in economic policy literature is to use a quadratic social welfare function.(17)

The quadratic social welfare function in its general form is the sum of squares of deviations between the actual level of the economic policy's goal and the desired one:

$$U = - \left\{ \sum_{i=1}^n W_i (X_i - X_i^*)^2 + \sum_{i=1}^n \sum_{j=1}^n R_{ij} (X_i - X_i^*) (X_j - X_j^*) \right\}$$

where

U : the utility derived from the policy performance

X : actual(obtained) value of the policy-makers' goal

X*: desired value of X

W : weights on alternative policy objectives

R : weights of the correlation between various objectives (R_{ii}=0)

The above function is a generalization of the objective functions used in the theory of economic policy. The expression in brackets indicates the level of disutility derived from the performance of the policy-makers. The negative sign in front makes it the level of utility. The first term in brackets indicates that the higher the difference between the actual level of the objective and the desired value, the higher is the derived disutility(the term is squared). The second term adds even more disutility, if the

(17) The properties of the quadratic social welfare function have been evaluated by Theil(1964).

deviation of one policy objective happens to relate with a high deviation in another policy objective. For example, combined inflation and unemployment add further disutility to policy-makers social welfare function. However, the simultaneous existence of unemployment and inflation should add more disutility than the sum of the two disutilities.

One of the suggested pitfalls of the quadratic social welfare function is that it evaluates equally positive and negative deviations from the desired levels. However, it is used because it is mathematically operational. It is a second best choice. This view is the result of what conventional economists believe to be the workings of the mixed capitalist economies. An example will illustrate this point. Assume that the policy makers have a target value of 5% for unemployment. An actual value of 2% and 8% makes no difference in terms of the utility derived from each one of them. One would argue that a 2% unemployment appears to be better than a 8%. Thus, in the first case of 2%, we must end up with more utility than with 8%, or even more utility than 5%. However, unemployment is necessary for capitalism. There is always an optimal level which guarantees a low wage rate, mobility in the labor market and social stability.

An optimal level of unemployment may be defined the same way that M. Friedman defines his 'natural' rate of unemployment. Following, Friedman we assume that this optimal level may vary between countries or in the same country, if the structure of the labor market changes. The only difference with Friedman's definition is that the optimal level of unemployment is not 'natural' but it relates to the capitalistic economic system. If

this level is 5%, then deviations from this level, in both directions, might create economic problems. An unemployment rate higher than 5% might undermine the stability of the capitalist system. A lower rate than 5% might increase the wage rate at a level which creates problems in the accumulation process. Thus, both 2% and 8% unemployment can be considered as undesired and this is perfectly consistent with the capitalist economies.

We can state now the problem of the policy makers. Once the social welfare function has been fully specified (all targets have been included along with their appropriate weights), then an attempt should be made to maximize this function. These attempts involve policy-makers' actions on economic variables controlled by the government. The various groups of economic variables relevant to policy analysis are examined in the next section.

2. The Elements of Economic Policy

In the previous section we discussed the goals of economic policy. We stated that the government attempts to maximize a social welfare function, which has the policy objectives as its elements. In this section, we discuss the tools and the mechanism of government policy actions. In other words, we present the elements of economic policy. This includes various groups (sets) of economic variables.

Economic policies involve government actions on specific economic variables. The choice of these variables and the assigned values is the subject matter of the theory of economic

policy. These variables belong to the set of economic variables describing the whole economy. Subsets of these economic variables can be defined as targets, instruments, data, irrelevant variables, and intermediate targets.(18)

Target variables refer to the goals of policy-makers examined in the previous section as the objectives of economic policy. It is the set of economic variables that government attempts to affect in a systematic and consistent manner.(19) Target variables enter in a specific way in the social welfare function. However, the various targets are not independent of each other. This should be of concern to the policy-makers. For example, if the trade-off curve makes sense, then unemployment and inflation may enter the social welfare function but in a very specific relation.

The number of targets of economic policy depends on the willingness of the government to intervene in the economy. A pure laissez-faire approach and complete state control of the economy are the two extremes of government intervention. In the first case, the state has set no policy objective and hence no systematic policy. This policy implies a number of targets equal to zero. On the other hand, a complete state control of the economy implies that all the important economic activities become the objectives of economic policy. In this case, the targets can be very numerous.

(18) See Tinbergen(1952, 1954 and 1967), Fleming(1968), Fox et al.(1973) and B.M. Friedman(1975).

(19) Economic policy deals with systematic actions because unsystematic policy actions can affect the targets but is of no purpose. For example, government can set the growth of money supply in a random (unsystematic) way. This might affect the target variables but it is of no use for economic stabilization.

In the mixed economies the two extremes are irrelevant. The number of targets chosen by policy makers are very few and are usually those discussed in the previous section. Which variables are chosen as targets depends very much on the social, political and economic state of a particular country.(20)

The choice of target variables is not a once and for all decision. It can vary depending on the specific country and on the period of time. A shift in the objectives of the policy makers is not uncommon in the advanced mixed economies. After the war the immediate objective was for economic growth. In the 1970's and 1980's we had a shift to inflation as the primary objective. The shift in the policy objectives does not involve the complete abandonment of one goal in favour of another. It involves rather the reconsideration of different weights and priorities for the various target variables. Targets may completely be eliminated from the 'menu' of objectives, if they become irrelevant. Inflation is not the objective of policy makers in periods of close to zero inflation rate. Unemployment is usually not an issue in periods of high economic growth. Other targets, such as economic growth and development, might be part of any policy objectives list in any period of time. Thus, we can distinguish between permanent and temporary targets.

Another distinction regarding targets has been proposed by Tinbergen(1954), which distinguishes between fixed and flexible

(20) Political refers to the type of government in power, social refers to the degree of society's willingness to accept the current social system, economic refers to the particular economic problems of the time. Needless to say, all these three are interdependent and in most cases almost inseparable.

targets. Fixed targets are those whose value is specified a priori. Flexible are those whose value is subject to the maximum or minimum value possible. Government may aim for 4% economic growth (a fixed target) or for maximization of economic growth (a flexible target). Fixed targets have the advantage of being verifiable by all the parties concerned. On the other hand, flexible targets become vague and it is very difficult to evaluate the success of policy-makers. An alternative would be a mixed approach. Government sets minimum or maximum levels and then attempts to get the best value possible, maximum or minimum.

Another important subset of economic variables relevant to the theory of economic policy is the set of instruments. Among economists the choice of the appropriate instrument has been more controversial than the choice of target variables. In economic policy literature this is referred to as the instrument problem.(21) Instruments are all those economic variables that are subject to the direct and immediate control of the policy authorities. Variables such as the various taxes, government expenditures, money supply, and exchange rate have been the most important economic instruments. The choice of the appropriate instrument has become one of the most important aspects of the theory of economic policy.(22) The selection of the appropriate instrument has been based on a number of criteria. The most

(21) See Poole(1970). It is interesting to note here that the instrument problem is different from the policy choice we discuss in the next section. Monetary policy vs fiscal policy, for instance, is an instrument problem, whilst demand vs supply management is a policy choice problem.

(22) See Poole(1970), Brainard(1967), Holbrook and Shapiro(1970) and Leroy and Lindsay(1978).

important of them has been the effectiveness and the efficiency of the policy instrument.

The effectiveness of a policy measure is related to the multiplier effect. It has to do with the quantitative change of the instrument and the quantitative effect on the target variable.(23) An instrument is more effective, if it enables the policy authorities to achieve a higher quantitative change of the target variable in the right direction for a given quantitative change in the instrument. The effectiveness of a policy instrument is related to the structure of the economy as well as to how well this structure is known to the policy-makers.(24) Once this structure is known, the problem of policy-makers becomes a simpler one. All they have to do is to calculate the quantitative change in the target variable per unit change in the instrument. Then, the instrument that has the largest effect is selected.

Efficiency, on the other hand, refers to the reliability of the attained results. The question is how our results may differ, if 'mistakes' appear in the calculations. These mistakes can be of different types. First, the specification of the economic reality might not be the right one. How does a small change in the specification of the economic reality influence the relative effects of the various policy instruments? If all the other problems are assumed away, then the choice of an instrument will

(23) See Tinbergen(1952, p. 53 and 1956 pp. 57-58)

(24) In the case of certainty or 'certainty equivalence', changes in the economic structure do not affect the level of social utility. The only thing it has to change is the value of the instrument, i.e., the level of policy response. This is not the case with uncertainty as was explained by Brainard(1967).

depend upon the stability of its effect. Between two instruments, with identical quantitative effects for a given structural specification, policy-makers should select the one which is more stable in its effect on the target variable. The choice of an instrument requires effectiveness but inefficiency may be detrimental if the policy-makers are not very certain regarding their calculations. Efficiency requires a minimization of the variance of the effects under different specifications.

Effectiveness and efficiency are the most important economic criteria in determining the choice of an instrument. However, the practice of economic policy suggests that other criteria are used as well. In other words, effectiveness and efficiency are not the only aspects a policy-maker is looking for. How manageable an instrument is and its independence can be additional criteria.

The independence of an instrument is defined in terms of a specific target. An instrument is independent if it affects only one target and has no other effect. Independence becomes a property in an instrument, if other instruments affect other targets in the opposite direction to policy-makers' desires. A good example is the money supply. It can be used to stimulate economic activity in the short-run (increase output), but it might affect negatively other policy objectives, namely price stability. If policy-makers are able to identify for each target an independent instrument, then economic policy becomes a trivial problem. However, this is not the case in applied economic policy. Under circumstances of non-independence, the choice of the appropriate instrument will depend on how many targets are affected by a particular instrument. The one that is more

independent (which affects the least number of targets) should be selected.

The management of an instrument is a very important step in applied economic analysis. It has to do with the actual implementation of the policy, that is, with the political and administrative process of a particular country.(25) An example will illustrate the importance of the manageability of an instrument. The best example is taxation. Tax rates can be used as policy instruments. Their relative (optimal) values can be calculated and the choice is made using the previous criteria. However, because taxes can be evaded, an additional criterion of implementation of this type of policy should be taken into account. This problem becomes an important one, if the public administration is inefficient or the political will is not there for strict application of the policy.

Two more subsets of economic variables have become relevant in the theory of economic policy. These are the 'data' and the 'irrelevant' variables.(26) Data variables in an economic policy context are those variables that remain relatively constant or are given for a specific time period. These are not under the control of economic policy-makers. This subset can include such variables as technology, population and all the lagged values of economic variables (government cannot affect the previous year's level of investment). For a specific country, data variables might be the

(25) Administration problems with emphasis on fiscal policy are discussed by Vines et. al.(1983, part 3)

(26) Tinbergen(1952, ch. 2 and 1956, ch. 1) and Fox et al.(1973, ch. 2)

world markets. These types of economic variables can be considered as given in an economic policy problem. For example, policy-makers in a small open economy cannot affect the price of their imports or exports.

Irrelevant economic variables refer to those economic variables which are not included in the set of targets. These can be important economic variables such as the inflation rate, external debt, the budget deficit, but policy-makers consider them as being of no concern for their particular problem which might be unemployment or economic growth. These variables can be affected by policy actions but it is not in their intention to do so. In other words, irrelevant variables are those targets which enter the social welfare function with zero weights. Whatever their value, the choices of policy-makers are not affected.

The four types of economic variables are the most important ones. These were the concepts related to the original theory of economic policy. However, in later developments a new set of economic variables for policy analysis has been defined as 'intermediate targets'. The need for this new category arose from an information problem policy-makers faced with regard to the effects of their instruments and the actual economic situation in a given period of time.(27) Policy-makers have different information regarding the movement of various economic variables such as the level of output. Information regarding the value of output is available every three months and it is not always

(27) B.M. Friedman(1975, pp. 455-463). An empirical evaluation of the optimal intermediate targets is given by McMillin and Fackler(1984).

reliable (data revision is common practice).(28) The problem arises because of the time the observation is made, i.e., a low level of output, which might make the policy reaction too late. To solve this problem, policy-makers can choose other variables that are more readily observed as their targets, i.e., the interest rate. These targets are called intermediate targets. Intermediate targets can reveal something about the actual target of economic policy, i.e., the interest rate that comes out every week can be used to infer something about the level of output.

Once the economic variables have been classified as targets, instruments, data and irrelevant variables, the next problem of the policy-makers is to identify their interrelationships. These interrelationships define an economic model. The most important component of an economic model of a mixed economy is the behavioural equations regarding the demand and supply relations.(29) This is not surprising. Economic theory is based on the analysis of demand and supply. Demand deals with the ultimate goal of any economic activity, namely consumption. Supply refers to another important economic activity, namely production. Both production and consumption exhaust individuals' economic activities. Thus, any economic action by any actor has to affect either the supply or the demand side of the economy or both. One of the most important actors in a mixed economy is the government itself. Government economic actions can be aimed at the supply, the demand or both sides of the economy. It is very surprising

(28) See McNees(1986)

(29) The theory of economic models is summarized by Neal and Shone(1976).

that this fundamental distinction between supply and demand has not been fully considered in classifying all possible government economic policies. This task is undertaken in the next section.

3. A Suggested Classification

The theory of economic policy refers to any systematic state action aimed at affecting the economy. Thus, the object of economic policy is to re-direct the economic course in a way that government feels is appropriate. Alternative acts by the government constitute alternative economic policies. A number of different types of policies have been proposed, i.e., fiscal and monetary policy, industrial policies, demand management policies. Tinbergen(1952, 1954, and 1956) has distinguished between quantitative - qualitative policies and centralized - decentralized policies.(30) However, these distinctions do not adequately present all the alternative government economic policies. A theory of economic policy should clearly identify all the alternatives and analyze their effects. Then, it is up to political authorities to choose the most acceptable one. In this section, we propose a new classification of economic policies. It is a generalization of the alternative government interventions.

(30) Qualitative policies refer to those government actions which involve structural changes. Quantitative policies are numerical changes in the parameters or the instruments of economic policy. Centralized economic policies refer to one body of government taking the decisions of economic policy. Decentralized policies refer to more than one level of government taking the decisions.

Our classification is based on two important distinctions regarding the way the government intervenes and its effect on the economy. First, we take into account the basic components of economic analysis, namely demand and supply. When dealing with the macroeconomy, we shall refer to aggregate demand and supply. This distinction between aggregate demand and supply is very fundamental in the theory of economic policy; however, it has not been fully taken into account in a systematic way. It is true that economists, since Keynes, are talking about demand management policies, but here these policies are defined in the broader context of demand and supply management policies.(31)

What are the demand and supply management policies? Demand management policies are all those systematic government economic actions, which aim at affecting the consumption of goods and services. Supply management policies are all the systematic government economic actions whose main purpose is to affect the supply of goods and services in the economy. This distinction uses the most fundamental distinction in economics. However, we should note that supply and demand policies have interdependent effects. A demand management policy does affect the supply side of the economy because the two sides respond to each other either through the price or the planning mechanism. But what is important is that this effect is an indirect (through the demand) effect. Thus, government economic policies are demand or supply management

(31) Vines et al(1983) define demand management policies as the 'combination of budgetary, monetary and foreign exchange policies'. But these are the instruments of economic policy and they can be used to manage the demand as well as the supply side of the economy.

policies if the immediate effect of economic policy is on the demand or on the supply side of the economy.

The second important distinction used to classify government economic policies refers to the government actions themselves. It is related to the means through which government attempts to meet its policy objectives. These can be met through direct or indirect government economic activities. This distinction is used for the first time to distinguish between the various macroeconomic policies in a systematic way.(34) Direct government economic activities are those where the government becomes the actual agent of the economic act. In this case, the government is fully responsible for the activity. State consumption and government production of goods and services in general belong to the group of direct state economic activities. Most of the economic activities of governments of the so-called socialist countries belong to the category of direct state economic activities. In the mixed economies, the level of direct state economic activities varies considerably. The lowest is in the United States and the highest level is in Italy and France.(35)

Indirect government economic activities are those which affect other economic agents (business, labor, consumers) and through them, the demand or the supply side of the economy. These other actors are the principal (direct) agents of the economic activity that government policy wants to affect. The entire field of

(34) The theory of economic regulation has made this distinction between direct and indirect government economic activities. The latter is defined as economic regulation, see Mitnick(1980, ch. 1) and Sinkovics(1985).

(35) See Welsh(1982) and Shepherd(1981, Table 1).

economic regulation is related to indirect government economic activities but it does not exhaust them.(36) Economic regulation is associated with industrial policy. Indirect state economic activities refer to all government activities such as regulation, taxation, exchange rate policies, and external debt policies.

The distinction between direct and indirect government economic activities does not always have well defined boundaries. There are cases where government becomes an active economic actor along with the private sector. In this case, government does not have complete control of the economic activity. Mixed ventures with the private sector are an example of this type of government intervention. Even though these ventures might be important (it is expected to constitute a small portion of total government economic activities), for analytical purposes, we assume that they can be classified either as direct or indirect government economic activities.

By combining the two distinctions (aggregate supply and demand, direct and indirect government economic activities) we can classify government intervention for macroeconomic policy purposes into four categories. This classification exhausts all the alternative policies taken by the policy-makers. Each division has a particular purpose and aims to achieve a specific goal. Each policy has different effects on the targets of government economic activities. These effects and the circumstances under which one policy may be better than the other are discussed in the next chapter. Now we shall proceed to discuss each policy and the

(36) Economic regulation is discussed by Mitnick(1980)

instruments that can be used for each one.

	The side of the Economy	
	Supply	Demand
Government Actions		
Direct	Direct supply management economic policies	Direct Demand management economic policies
Indirect	Indirect supply management economic policies	Indirect Demand management economic policies

Direct supply management policies refer to government production of goods and services. State-owned enterprises are the legal form under which this policy is carried out and are the main instruments of this type of policy, (37) whose aim can be economic growth and development, employment, or the 'right' production of goods (taking into consideration the social cost of production such as the negative externalities). However, in the literature of state-owned enterprises, the main argument has been the relative efficiency of their operation vis-a-vis private production. (38) A macroeconomic policy approach will stress their effects on the policy objectives analyzed in the first section of this chapter. Nationalization is the instrument through which direct state supply management policies are undertaken. It involves a structural change by decreasing the relative role of the private sector in the economy. (39) Direct supply policies are pertinent to

(37) State-owned enterprises are evaluated by Baumol, ed. (1980).

(38) Baumol, ed. (1980), and Caves and Christensen (1980).

(39) This is not meant to imply that nationalization is against

regional development (where output is produced), building the infrastructure (such as roads and telecommunications) and providing a number of important services (such as banking, security, and arbitration).

Indirect supply management policies are those that affect the supply of goods and services produced by the non-government sector. These policies are designed primarily to facilitate the private production of goods. The instruments to implement these type of policies are numerous. It can include such things as monetary policy (facilitating the financing of various projects through a low interest rate), fiscal policy (use taxes and government expenditures), industrial policy (providing subsidies to develop a particular industry or regulating the price of its output). It is interesting to note here that the first two policies were considered as demand management policies. In our context they become instruments that can be used for supply management policies as well.

Direct demand management policies are the purchasing of goods and services by the government for its own use or to freely distributing them to other individuals.(40) Government buys a number of goods from the private sector. A direct demand management policy will be the systematic design of government purchases in such a way as to meet one of the policy

the private sector. It is the private sector itself that might ask the government to undertake such an activity; see Tupper and Doern(1983).

(40) It does not include transfer payments but it includes the transfer of output that takes place in such cases as food stamps and free meals in schools.

objectives.(41) It can buy from labor-intensive industries to promote the employment objective. Direct purchase of goods by the government can be used to stabilize aggregate demand in its long-run trend. These direct purchases can reduce total demand when there are inflationary pressures and can be increased when there are disinflationary pressures. We should note here that government purchases of goods and services are determined by non-policy considerations as well and, thus, cannot be set at any level possible.(42)

The last classification of economic policies refers to indirect demand management policies. These policies aim at the private aggregate demand, which involve a number of instruments such as fiscal policies, monetary policies, and social welfare policies. Indirect demand management policies have been the basic prescription of the Keynesian school. They dominated the activities of the policy-makers in the 1950's and 1960's. Still today, they exert a tremendous influence, as if they were the only policies available to affect the macroeconomy. Under certain circumstances, which are discussed in the next chapter, these policies may not be effective. However, this by no means implies that government intervention has failed. Other types of government interventions might be effective.

(41) Note that government purchases are not identical with government expenditures. The latter includes the purchase of labor power (public employees) which is not included in our concept of government purchases. The latter includes only those government expenditures that are used to buy final output.

(42) The determinants of government consumption are analyzed in chapter six below.

Conclusions

The purpose of this chapter was twofold. First, we presented the objectives of economic policy in terms of the post-war experience of the advanced mixed economies. The success of policy-makers in meeting these objectives can be evaluated by a quadratic utility function, which was shown to be more realistic than what was originally thought. The objectives of economic policy constitute one element in the theory of economic policy, namely the targets of policy-makers. Other variables were distinguished as the instruments, data, irrelevant and intermediate target variables pertinent to economic policy.

The second and the most important purpose of this chapter was to re-classify alternative economic policies in a very systematic and operational way. This distinction of economic policies is the most important contribution of this chapter. The grouping of alternative policies was based on two fundamental distinctions related to the immediate effect of government policies and the way in which this effect is exercised. The first distinction is the most important one in economic analysis between (aggregate) demand and supply. The second distinction refers to direct and indirect government economic intervention. By combining the two distinctions, we have four type of policies. Their effectiveness on specific economic policy targets is discussed in the next chapter.

C H A P T E R F O U R

THE EFFECTIVENESS OF ECONOMIC POLICY

''...there is nothing wrong ... to work toward the
eventual achievement of some target unemployment
rate through structural changes rather than
aggregate demand policies''.
Franco Modigliani (1977. p.13)

Introduction

In this chapter we will examine at the effectiveness of each alternative policy presented in the previous chapter. The effectiveness of alternative policies has been the subject of many macroeconomic controversies in the last two decades.(1) The main thrust of this debate has been the building of an argument in support of either the fiscal or monetary policy. However, both types of instruments (they are instruments of economic policies) have been used to affect the demand side of the economy. In other words, the fiscal-monetarist debate is an argument for the support of one or another instrument of economic policy in order to affect the aggregate demand side of the economy. This is not our concern in this chapter. Instead, we are looking at which policy is more effective in meeting the objectives of economic policy. It is after solving the problem of selecting the appropriate policy that the instrument question comes into the picture. Once the appropriate policy has been selected, then it is the task of policy-makers to choose the instrument which can achieve the required effects. One should first solve the problem of choosing the appropriate policy (direct-indirect demand management policies

(1) See Venieris(1977 ch. 15).

or direct-indirect supply management policies) and then proceed to find the appropriate instrument.(2) The choice of the appropriate policy is the subject of this chapter.

Government policy-makers have three choices. First, they can use demand management policies to reduce unemployment and inflation and increase the level of production. Second, they can attempt to achieve the same objectives by using supply management policies. Third, they can use a mixed policy of demand and supply management. In all three cases, policy-makers can use either direct or indirect government intervention.

Each policy can be effective depending on what type of economic situation a particular economy finds itself in. The particular conditions that make one policy more attractive than the other are examined in the next three sections. We will distinguish three types of economic situations: the extreme Keynesian of perfectly elastic aggregate supply curve, the extreme monetarist-New Classical case of perfectly inelastic aggregate supply curve, and the case of an upward sloping aggregate supply curve. Another important distinction we make is between demand and supply stochastic shocks. We then examine which policy is more effective under the various combinations of external shocks. In all cases we have chosen the diagrammatic exposition to simplify the analysis. A more rigorous approach is given in the next chapter.

(2) As a matter of fact, it is only indirect policies where the instrument argument becomes an issue. In the case of direct policies, there is no choice of alternative policies, i.e., the government is the consumer or the producer of goods and services.

In the first section we examine the conditions under which demand management policies are either effective or ineffective. It turns out that, in a Keynesian world, demand management policies are effective and they are the only ones which can be applied in order that the objectives of policy-makers be fulfilled. In the second section, we analyze supply management policies. Supply policies have no effect in a Keynesian world but can be very effective under a Monetarist or New Classical world. The last section studies the appropriateness of a mixed policy (a combination of demand and supply policies) under demand, supply or both demand and supply stochastic shocks. A mixed policy is preferred if government has more than one target and the economy is under the influence of both the demand and supply shocks.

1. Demand Management Policies

We have defined demand management policies as those systematic government economic actions which aim at affecting the total consumption (demand) of goods and services. These government actions can be direct (the government becomes a consumer itself), or indirect (the government affects the behaviour of private consumers). Even though both direct and indirect policies aim at the demand side of the economy, they might not have identical effects.

Direct demand management policies have a certain effect on the total demand. When government increases (decreases) its demand for current goods and services, total demand increases (decreases).

However, it has been argued that an increase in government demand may not increase total demand because private demand decreases.(3) This argument is more suitable for the indirect demand policies. The effect of direct demand policies is always positive as long as the private marginal propensity to consume is less than one. If government increases its own consumption by one additional dollar, the private sector's consumption does not decrease by as much as that amount because the marginal propensity to consume by the private sector is less than one. What the private sector saves becomes additional expenditure as government consumption.

If for various reasons the private sector does not respond to government economic policy actions, then indirect demand policies can be less effective.(4) Suppose government attempts to increase total demand for goods and services by decreasing income or excise taxes. If the economy is in a deflationary state, then the decrease in prices need not increase consumption. Anticipating future price decreases causes consumers to postpone expenditures. On the other hand, an increase in taxes to reduce aggregate demand in an environment of inflationary pressures may not decrease aggregate demand, but rather increase it because consumers expect future price increases. The relative effect of each policy depends upon the economic structure of a given economy in a given period of time. This structure is examined in the next chapter.

(3) This argument is related to the 'crowding out' effect. See Blinder and Solow(1973), Barro(1974), Tobin and Buiter(1976) and B. Friedman(1978).

(4) Sandford(1982, p. 50) is quite right when he argues that '...the recipients of transfer payments, not the government, determine what the money shall be spent on.' The only thing that should be added is that the recipients have always the choice not to spend.

As we stated in the previous chapter, it is one of the tasks of policy-makers to discover this structure.

Under what general economic circumstances should policy-makers use demand management policies? What are the factors that make demand management policies more appropriate relative to supply management policies? In this section we discuss the relative advantages of the demand policies. We analyze their effect on the price level (inflation), output, and unemployment. We assume that total aggregate demand is divided into state and private demand with the latter constituting a larger share. Private aggregate demand is negatively related to the price level. An increase in the price level reduces real wages and therefore current consumption through an income effect. It also decreases current consumption because the increase in price reduces the value of real wealth. Another explanation of the negative relation is that the increase in price increases uncertainty, which in turn decrease current consumption. For simplicity we assume that the state demand is independent of the price level.⁽⁵⁾ We can rationalize this assumption by having state demand be determined by policy considerations alone.

We can graph the two aggregate demand functions and derive the total aggregate demand (graphs appear at the end of this chapter). Figure 4.1 graphs the state demand(SD), private demand(PD), and total demand(AD) functions. Total demand is derived by the horizontal addition of the first two demand curves. Figure 4.1

(5) The nature of the results do not change if we assume a downward sloping state demand function.

can be used to demonstrate graphically direct and indirect demand management policies. A demand management policy is defined as those systematic government economic actions which aim at shifting the total demand curve. Direct demand management policies achieve this by shifting the state demand curve. Indirect demand management policies are defined as those measures that shift the private aggregate demand curve. In other words, we assume that total aggregate demand depends on decisions taken by the private and the government sector. Private demand depends on both sectors' decisions while state demand depends solely on policy-makers' choices. Using figure 4.1, we can show that government can decrease total demand by either decreasing state demand to SD' or affecting private consumers' behaviour and thus shifting private demand to the left.

The effectiveness of demand management policies (both direct and indirect) can be shown once we introduce the supply side of the economy. We assume at the moment only one aggregate supply. We also assume that the only alternative to policy-makers is demand management policies. We can distinguish three cases related to the way aggregate supply enters the graph. First, we have the extreme Keynesian aggregate supply case. The extreme Keynesian argument calls for a perfectly elastic aggregate supply curve. This is shown in figure 4.2a. Figure 4.2b gives the corresponding level of employment for a given level of output (employment-output curve). Suppose we start from a position which is given by point C. This determines a level of unemployment equal to AB. Policy-makers perceive this as socially unacceptable and blame it on weak

aggregate demand.(6) Under this type of economic situation (insufficient aggregate demand), the only policy that can be effective is demand management policies. Government can act directly or indirectly to increase total aggregate demand. Suppose government decides to pursue a direct policy by increasing its purchases of goods and services. The effect is to shift SD to SD' and therefore it shifts total demand to the right(AD'). The new equilibrium occurs at D which determines a lower level of unemployment(A'B'), a higher level of output, and there is no pressure on the price level so that all the increase in state demand is transferred into an increase of total aggregate demand. In other words, there is no crowding out of private consumption due to an increase in state consumption. This crowding out would be possible if the increase in state consumption had increased the price level.

The second case is the extreme long-run monetarist and short-run New Classical position. In this case, the basic assumption is that all markets clear including the labor market. The level of output is fixed at its general equilibrium level. Aggregate supply is perfectly inelastic at this level of output. The level of output (Y_0) is determined by the optimal level of unemployment. As long as unemployment exists, the level of actual output will always be less than the full labor capacity level of output (Y^*). In this case, demand management policies are ineffective. This is

(6) Policy-makers can recognize an ineffective aggregate demand because they observe a wage rate too low, a profit rate too high so that they infer no supply-side problem. On the other hand, sales have been dropping due to a decrease in exports for example or changes in the consumption pattern of profit or wage earners.

true for both direct or indirect demand policies. Figure 4.3 presents this case. An increase in state demand to SD' increases aggregate demand to AD' but the level of output (unemployment) remains the same (Y_0 and E_0). The higher state demand is completely crowded out by a higher price level (from P_0 to P_1). In this case, the result is demand-pull inflation initiated by government demand policies. Unemployment does exist because of the optimal level of unemployment. As we shall demonstrate in the next section, demand management policies do not work but in this case supply management policies can be effective.

The third case is when aggregate supply is a normal upward sloping curve. In this instance, the total effect of demand management policies depends very much upon the elasticities of aggregate demand and aggregate supply. In other words, it depends upon the region of the aggregate supply and demand curve the economy is in. Figure 4.4 depicts this situation. If we are near the full employment level of output, such as Y_1 , then demand management policies have little effect on the level of output and unemployment but have a large effect on the price level and therefore inflation. On the other hand, if the starting point is a level of output close to Y_0 , then demand management policies have little effect on the price level and thus inflation, but they have a relatively larger effect on the level of output and the unemployment rate. Thus, the effectiveness of demand management policies in this case depends on the elasticities of aggregate demand and supply and the economic situation a particular economy is in.

2. Supply Management Policies

Supply management policies are defined as those systematic government economic actions which aim at affecting the supply side of the economy. As was the case with demand management policies, supply management policies can be either direct (government undertakes the production of goods and services), or indirect (government affects the supply of goods and services by private producers). Supply policies have demand effects but this is the result of their primary effect on the supply-side of the economy. The same is true for the demand policies, i.e., they have a supply effect but this is initiated by their effect on the demand-side. Thus, demand or supply management policies are defined in terms of their original effect (on the demand or the supply side), which is presumed to be the target of policy-makers.

Direct supply management policies differ from the indirect ones in terms of their effectiveness. Direct supply management policies have a certain effect on the aggregate supply. This is not true for indirect policies. For example, assume that government wants to increase the production of goods in a particular region of the country. They can do this effectively by following a supply management type of policy. A direct supply policy will include the formation of a state enterprise or any other form of public production. The effect will be a certain increase in the output of the region.(7) The alternative is an indirect supply management

(7) We abstract from efficiency considerations, i.e., it might be more profitable to produce the same output somewhere else.

policy. Government can provide a number of incentives to the private sector for production in the region. However, there are many reasons why the private sector may not act.(8) In such a case, indirect supply management policy will fail.

In examining the conditions under which supply management policies are effective, we abstract from the relative efficiency of the indirect and direct supply management policies. Instead we assume that both can have the same effect on aggregate supply. We should note here that the difference between direct and indirect supply policies relates to the efficiency and not to the effectiveness of policy measures.(9) It can always be true that indirect supply management policies have the same effect as the direct ones, if the former were of greater magnitude. In the above example, if the incentives are very strong, they might persuade the private sector to undertake the economic activity in the specific region. Nevertheless, private agents are faced with a situation of uncertainty about future government actions.

The effectiveness of the supply management policies (particularly the direct supply policies) depend very much on their effect on the private supply of goods. It is possible that public production completely substitutes for private production and adds nothing to total supply of goods and services. This is a case of supply crowding-out. It occurs when the state nationalizes already existing private industries. However, we do

(8) The incentives might not be enough to outweigh the risk involved, the private sector does not trust the government, the political process is an uncertain one, etc.

(9) In chapter three we gave definitions of the effectiveness and the efficiency of economic policies.

expect that direct supply management policies have a real effect, particularly in the mixed economies, which is of our concern here. This belief is based on our economic theory of the state discussed in the second chapter. The state in a mixed capitalist economy will limit the substitution of public production for private production. If the government undertakes direct supply management policies, it does so because it perceives that the private sector is either unable or unwilling to supply fully a particular commodity.

We proceed now to discuss the effect of supply management policies on the level of output, employment, and the price level (inflation rate). We assume that the total (national) aggregate supply is consisted of two parts: the state aggregate supply and the private aggregate supply of goods and services. In most mixed economies, the private supply of goods and services constitutes the larger part of the total. We also assume that state aggregate supply depends only on the policy-makers' decisions and not on the price level.⁽¹⁰⁾ Private aggregate production depends positively on the price level unless we are looking at the extreme Keynesian or Monetarist cases. It also depends on the decisions of policy-makers. This is the influence of indirect supply management policies. Figure 4.5 shows the state aggregate supply(SY), the private supply(PS), and the total supply(AS). The latter is the horizontal summation of the first two.

(10) This is the same assumption we made previously for state aggregate demand. Again the nature of our results are not affected if we assume an upward sloping state aggregate supply.

Before we discuss the effectiveness of supply side policies it is appropriate at this point to define them in terms of the graphical analysis presented in this chapter. An economist brought up in the Keynesian tradition would argue that building infrastructure, which is considered for our purposes here as a direct supply side policy, is first a demand management policy because it increases government expenditures and then a supply management policy. In other words, the aggregate demand curve should shift to the right. Now if we assume that building infrastructure increases the economy's capital stock and therefore it should shift the aggregate supply to the right, then the price effect of such a policy is indeterminate. If the price level decreases, then we may argue that the supply effect dominated. However, the initial effect of an increase in aggregate demand may not occur for two reasons. First, the recent debate on the Ricardian Equivalence Theorem has pointed out the possibility that an increase in government expenditures simply crowds out current private expenditures through the anticipated increase in future taxes; see Barro (1974). In this case demand does not increase but supply does increase. Second, and most important for our argument here, an increase in aggregate demand would never occur if policies (demand or supply) are designed for a given level of government expenditures. An example will illustrate this important point. Suppose policy-makers decide to change their policy from a demand to a supply policy because output is low and prices are high. In order to achieve this they decrease government expenditures on current goods and services and they increase by an equal amount state investment. Now the demand effect is zero but the supply effect is not zero. Using state investment to build a

factory or infrastructure will shift aggregate supply without shifting aggregate demand. It is in this context that we talk of supply management policies as being distinguished from demand management policies.

The state supply curve is shifted only through direct supply management policies.⁽¹¹⁾ An increase in state production shifts state supply to the right. This in turn will shift the total supply curve to the right. We again abstract from the effect of state supply on the private supply. It is quite possible that this effect is negative, in which case the private supply curve shifts to the left. This in turn will shift the total supply to the left. The overall effect on the total supply is indeterminate. It can be positive, negative, or have no effect. The result depends on the relative shifts of SY and PS curves. If the effect of SY on PS is so negative that it causes AS to shift to the left of the original one (before the policy change), then we not only have a complete crowding out of public production but a total decrease of the original level of output. In this case, the policy might have the opposite effect from what it was originally intended to produce. On the other hand, if PS shifts to the right, i.e., SY and PS are positively correlated (this can be the case if government builds infrastructure which makes new private production profitable), then the effect on PS reinforces the direct supply effect on the AS curve. In what it follows we assume

(11) As a matter of fact, we can define the two (direct and indirect) supply management policies in terms of their effect on the state and private supply curve. The direct supply management policies shift the state supply curve while the indirect supply management policies shift the private aggregate supply.

that shifts of SY do not affect PS. The PS curve is shifted only through indirect supply management policies.

The effectiveness of supply management policies can be shown when the demand side of the economy is included in the same diagram. However, aggregate demand can enter only in one way - as a negatively sloping curve. We cannot rationalize an aggregate demand which is perfectly elastic or inelastic at the macroeconomic (aggregate) level.(12) We therefore assume that aggregate demand depends negatively on the price level. Its slope is an empirical question but can be neither zero nor infinite.

Contrary to the demand curve, the supply curve can take any shape, including perfectly elastic or inelastic. We start by looking at the effectiveness of the supply management policies under the purely Keynesian economy. The total aggregate supply is perfectly elastic at a given price level P_0 , in figure 4.6. The aggregate demand determines a level of output equal to Y_0 . This level of output is supplied by both the private and public sectors. The level of private output is found by subtracting the state output from the total level of output ($PS_0 = Y_0 - SY_0$). If policy-makers perceive the total level of output (Y_0) at point C as too small, then a direct supply management policy can increase it by shifting the state output supply curve to the right (SY'). However, total output as it is determined by the intersection of the aggregate demand and supply at point C does not increase. Instead, we have an increase in state output from SY_0 to SY' and

(12) At the microeconomic level, i.e., a market for a particular commodity, the demand can be perfectly inelastic or elastic or at least very close to this state.

an equal decrease of private output from PS_0 to PS_1 ($PS_1 = Y_0 - SY_1$). In this case of perfectly elastic private aggregate supply curve (and therefore total aggregate supply), direct supply management policies do not work. The reason is that the level of output, and therefore employment, in this extreme Keynesian economy is completely demand-determined.

The extreme Monetarist and New Classical case is depicted in figure 4.7. Suppose we start from a position at point C, which determines a level of output Y_0 and a price level P_0 . Both private and state supply are perfectly inelastic at PS and SY , with the latter being smaller. At point C, policy-makers perceive that the unemployment is too high (AB), as is depicted by the bottom part of figure 4.7. Government attempts to increase employment by direct supply management policies. In this case the SY curve shifts to the right to SY' . The total output curve shifts to the right to AS' . The new level of equilibrium at D determines a higher level of output (Y_1), a lower level of unemployment ($A'B'$), and a reduction in the aggregate price level (from P_0 to P_1). In this case direct supply management policies are effective in meeting all the targets of economic policy-makers of reducing unemployment and inflation and increasing output.

The same results of higher output and employment and lower price increases can be attained by indirect supply management policies. This will result in a shift of the PS curve to the right. How can this be done? Assume that the level of private output at C corresponds to what Friedman(1968) refers to as the natural rate of unemployment level of output, which rate of unemployment is equal to say 10%. Furthermore, assume that 2% of

unemployment is due to the cost of mobility, which Friedman refers to in his definition of the natural rate of unemployment. Government indirect supply management policies can reduce unemployment by eliminating the cost of mobility. This can be done by giving incentives to the private sector for producing in a region where labor is less mobile (and thus it has the highest unemployment rate). Alternatively, they can undertake state production in the area. Both policies increase output and employment and decrease the price level. Thus, even if we assume that the natural rate of unemployment theory rendered demand management policies ineffective, it is not an argument supporting government non-intervention. In other words, it is true that demand policies with a vertical supply curve do not work but supply management policies do work.(14) Thus, government economic intervention can have real effects if the right policy is pursued, i.e., in this case supply-management policies.

The last type of an economic situation arises when neither the extreme Keynesian nor the extreme Monetarist position is applicable. In this case, aggregate supply is upward-sloping, which is the result of an upward sloping private aggregate supply curve. This situation is graphed in figure 4.8. Suppose we start from a position at point C with a price level equal to P_0 , total output equal to Y_0 , and employment equal to E_0 . Government perceives that unemployment is too high. It can reduce

(14) It is interesting to note that Keynes(1937) was well aware that in the late stage of the recovery further applications of aggregate demand-management policies may not work. Instead, he proposed a 'rightly distributed demand' rather than 'greater aggregate demand'. His preoccupation with demand-management policies did not allow him to examine supply-management policies.

unemployment by increasing government production and thus shifting the SY curve to SY', which shifts AS to AS'. The new equilibrium point is D which gives a higher level of output(Y_1), higher employment(E_1), and a lower price level(P_1). In this case, we have the same qualitative results as in the previous case. However, the upward-sloping private supply curve results in lower private output because the increase in state production has decreased the price level and therefore private output. Thus, state production crowds out some private production through a lower price level. How much depends upon the slope of the PS curve. The steeper (flatter) the curve, the less (more) private output is crowded out.

In the type of the economy depicted in figure 4.8, demand management policies are as effective as supply management policies in terms of output and employment. However, there is an important difference. Demand management policies have the opposite effect on the price level in comparison to the supply management policies. Supply management policies result in positive effects on unemployment and inflation (decreasing or increasing them at the same time) which make them attractive policies in situations of stagflation. On the other hand, demand management policies have an opposite effect on the unemployment and price level, which make them attractive policy alternatives in the case of recessionary or excess demand pressures. This opposite effect solves the 'signal' problem policy-makers face. If the economy experiences stagflation, then policy-makers know that supply-side policies should be applied. If the economy experiences either inflation or unemployment, then demand policies should be applied.

3. Mixed Policy

In the last two sections we analyzed economic situations in which either the demand or the supply or both policies appeared to be more effective. Demand management policies appear to be more effective when the aggregate supply was close to a Keynesian type. On the other hand, supply management policies appear to be more effective when the economic world resembles the Monetarist or New Classical one. The most important point that the previous section brought into light is that the argument for government or government economic non-intervention is not based on sound theoretical foundations. What becomes important is whether government should intervene in the demand or the supply side of the economy. The argument is not for government non-intervention, but for the appropriate government intervention.

In this section we extend the policy options. So far we have assumed that policy-makers use either demand or supply management policies. Now we relax this assumption. Instead, we allow for policy-makers to use both demand and supply management policies, which can be termed a 'mixed policy'.⁽¹⁵⁾ The question we attempt to answer is whether such a mixed policy is more effective than either a demand or a supply management policy.

We have seen that output, prices, and employment can be affected by either demand or supply policies. Their effectiveness

(15) Poole(1970) has used the same term to define combinations of fiscal and monetary instruments. Both, however, were referring to demand management policies. In other words, the mixed policy was not for the alternative policies but for alternative instruments.

might be undermined if the effects on the output and price do not conform with policy-makers' desires. This case will arise when policy-makers attempt to affect employment but leave the price level unchanged. This is possible only in the extreme (unrealistic) case of a Keynesian world. In the case of normally sloping demand and supply curves, a shift in the aggregate demand or aggregate supply has an effect on the price level. This demand or supply management policy is partially effective. However, if both policies are used, the price level can be stabilized around a given target. Suppose we start from a position C in figure 4.9 and the goal of policy-makers is a higher level of output but at the same price level(P_0). This can be achieved by shifting both the AD and the AS curves to the right until they meet at point D. This new level of equilibrium is characterized by the same price level but a higher level of output.

The relative shifts of AS and AD curves depend on their slope (the price elasticity of aggregate demand and supply). The more elastic (inelastic) the aggregate supply or demand, the less (more) the curve has to shift. Again the relative shifts of the curves become an empirical question. Thus, we have shown that a mixed policy is to be preferred to a purely supply or a demand management policy. A purely demand management policy will shift the AD curve to point G, which gives the same level of output as the mixed policy(Y_1) but at a higher price level. On the other hand, a purely supply management policy would shift AS to point F, where the desired level of output is attained at a lower price level.

Mixed policy can be more effective if the objective of policy-makers is to stabilize the level of output at a given value. Assuming that we start from this optimal level of output, we can have two type of shocks that destabilize the economy, i.e., demand and supply shocks. Suppose AS is subject to a stochastic variability (positive or negative), shifting AS to AS' (for a negative supply shock) or to AS'' (for a positive supply shock), which is shown in figure 4.10. If the goal of policy-makers is to stabilize output around Y^* , then they can achieve this by a demand management policy which shifts the AD curve to point F for a negative supply shock or to point E for a positive supply shock. In both cases the price level is changing, which might be an additional cost to the objective function of policy-makers.(16)

On the other hand, purely supply management policies can meet both objectives (price and output stability) of policy makers. If there is a positive supply shock, then a decrease in public output will shift aggregate supply from AS'' to AS. If there is a negative supply shock, policy-makers can increase public output until AS' cuts AD at point C. In both cases policy-makers can use indirect supply management policies to shift AS in the right direction.

The case of a positive or a negative demand shock is depicted in figure 4.11. Supply management policies can shift AS (to points

(16) Note that the case of a negative supply shock and demand management policies characterized the period of the 1970's. During this period we had a negative supply shock due to the oil price increase and, at the same time, old Keynesian policies of demand management. The result was an increase in the inflation rate, which if it is joined with a steep aggregate supply curve, has a very small output (employment) effect.

F or E) so that output is stabilized at Y^* but at the cost of price instability. However, direct or indirect demand management policies can be used to achieve both price and output stability. In the case of a positive demand shock, AD'' can be shifted back to AD by a decrease in the state demand of goods and services. On the other hand, a negative demand shock can be absorbed by an increase in the state demand for goods and services, which shifts the aggregate demand curve from AD' to the right until it cuts the AS curve at point C.

Demand management policies appear more effective in the case of demand shocks and supply policies are more appropriate in the case of supply shocks. However, in the case of both supply and demand shocks, neither policy can by itself stabilize price and output (employment).

We can distinguish four combinations of stochastic macroeconomic shocks. These are combinations of positive and negative supply and demand shocks. Suppose that both shocks are positive as in figure 4.12. In this case, neither a demand management policy nor a supply management policy can be effective. Assume we start from point C with an optimal level of price P^* and output Y^* . The positive shocks in the demand and the supply equation shift both the AD and the AS curve to the right. The new equilibrium point is at D. At this point the equilibrium output is definitely higher than Y^* but the price level can remain the same, be higher, or lower than P^* . It all depends on the relative shifts of the AD and AS curves. A purely supply management policy will shift the aggregate supply to point E, which gives the original level of output Y^* but at a higher price level. On the other

hand, a purely demand management policy will shift aggregate demand from AD' to point F, where the price level is below the optimal level of P^* . Thus, both policies cannot stabilize the price level. The same would be true for output if policy-makers used either policy to stabilize the price level. In other words, they cannot meet both objectives with one policy alone. However, a mixed policy can be used to shift both the AD and the AS curve back to the original position at point C. The same type of argument applies when we have demand and supply shocks that are both negative. It is easily verified that a mixed policy is better than a demand or supply management policy.

The other two cases can occur when we have positive (negative) shocks in the aggregate demand and negative (positive) shocks in the aggregate supply. The case of a positive supply shock and a negative demand shock is shown in figure 4.13. Here, the effect on the price level is definitely negative but the effect on output (employment) depends on the relative shifts of the AD and the AS curves. We have drawn the curves in such a way as to make the effect on output positive. Again, a purely demand or supply management policy is suboptimal. A demand policy will shift the AD curve to point E where output is stabilized but at the cost of price instability. A supply management policy can shift the AS curve to point F, which gives the optimal level of output with price instability even though it is less than it would have been under the demand management policies or even relative to the new equilibrium point at D. A mixed policy can shift both curves of the AD and AS back to the original point C. This can be done by a leftward shift of the aggregate supply (a decrease in state

output) and rightward shift of the aggregate demand (an increase in state consumption). Thus, a mixed policy in the presence of a negative demand shock and a positive supply shock appears to be more effective. The same type of argument can be made for the case of a positive demand shock and a negative supply shock. In both cases the mixed policy is better.

We can then conclude that a mixed policy (a combination of demand and supply management policies) is preferable in the case of more than one policy objective and where we have stochastic variations in both the demand and the supply side of the economy. It is the task of policy makers to discover the type of shocks or their combination in order that they can apply the appropriate policies. This is not an easy task and estimating the structure of the economy might be more important than applying the right policy.

Conclusions

The underlying hypothesis of this chapter has been that the argument for government non-intervention is based on a weak theoretical foundation. This is because not all possible forms of government intervention have been taken into account. Our basic proposition in this chapter has been that the debate between government and government non-intervention was based on a one-sided approach to economic policy. If all sides are taken into account, then the right question economic policy has to answer is which policy is more effective under given economic circumstances.

In this chapter we diagrammatically analyzed the effectiveness of each policy we discussed in the previous chapter. We found that government intervention is preferable to non-intervention. However, not all types of government economic intervention were considered appropriate for a given economic environment. It appears that demand management (Keynesian) policies are to be preferred in an environment of demand shocks and a perfectly elastic aggregate supply curve. On the other hand, in a long-run Monetarist and a short-run New Classical world, government intervention is preferable but not through demand management policies. This is true in the case of supply shocks as well. In both cases, supply management policies are effective in meeting the various objectives of policy-makers.

Finally, a mixed policy (demand and supply management policies) is more effective when the economy is under demand and supply shocks and the policy-makers attempt to satisfy more than one goal.

Our presentation, however, had certain limitations. We left out the discussion on the effectiveness of the various instruments because we wanted to concentrate on the selection of the appropriate policy as opposed to the appropriate instrument. It is a step-by-step approach. First, policy-makers have to decide whether a demand, a supply, or mixed policy is required. Second, they have to decide whether an indirect or direct government intervention is more acceptable and/or effective. Third, policy-makers have to decide on the most effective instrument. The entire debate on fiscal versus monetary policy is a contribution to the selection of the appropriate instrument in the case of indirect

demand management policies. Further research is required to examine the effectiveness of policy instruments when the other three policies are pursued by the policy-makers.

FIGURE 4.1: STATE, PRIVATE AND TOTAL AGGREGATE DEMAND

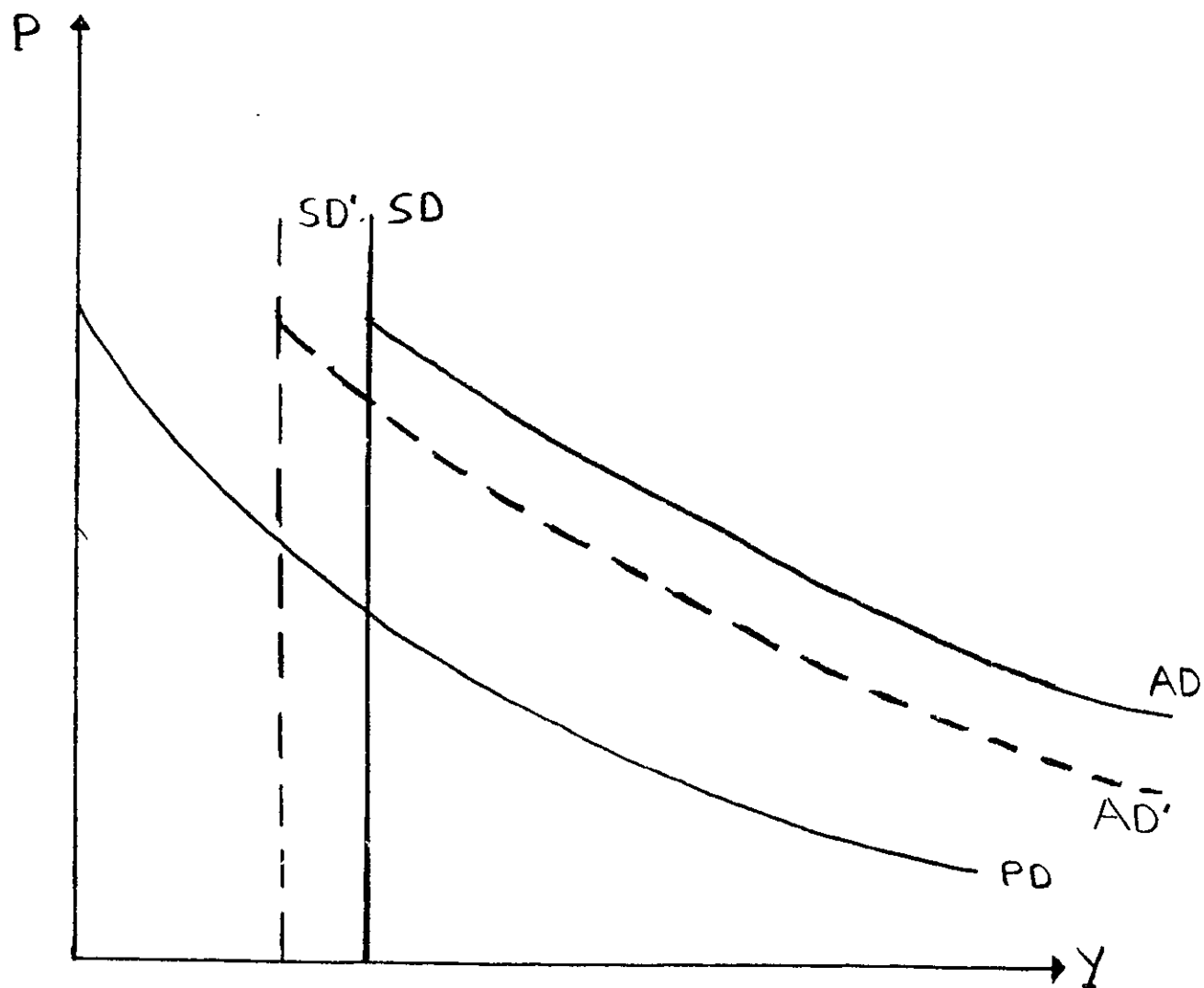


FIGURE 4.2: DEMAND POLICIES WITH FLAT AGGREGATE SUPPLY

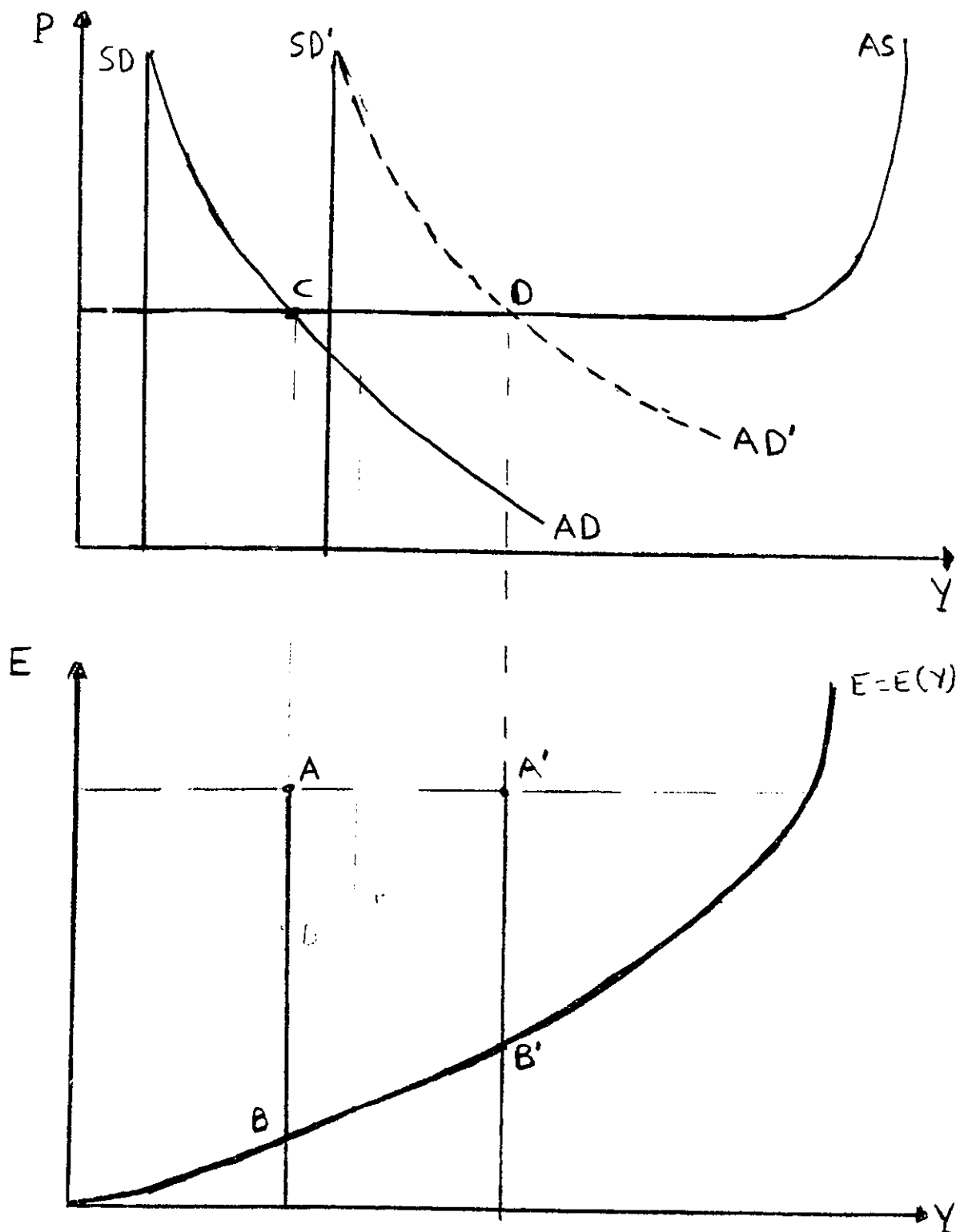


FIGURE 4.3: DEMAND POLICIES WITH STEEP AGGREGATE SUPPLY

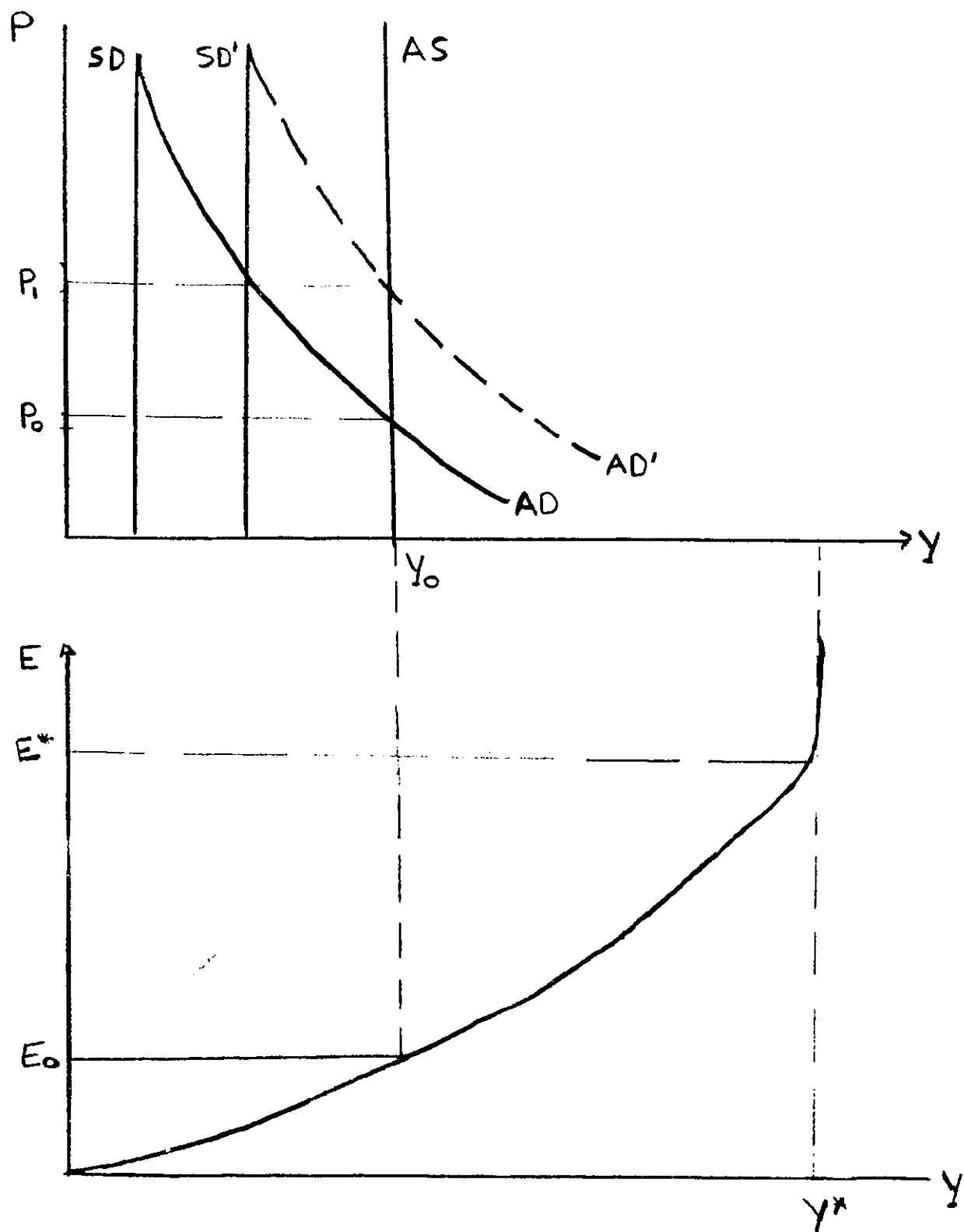


FIGURE 4.4: AGGREGATE DEMAND AND AGGREGATE SUPPLY

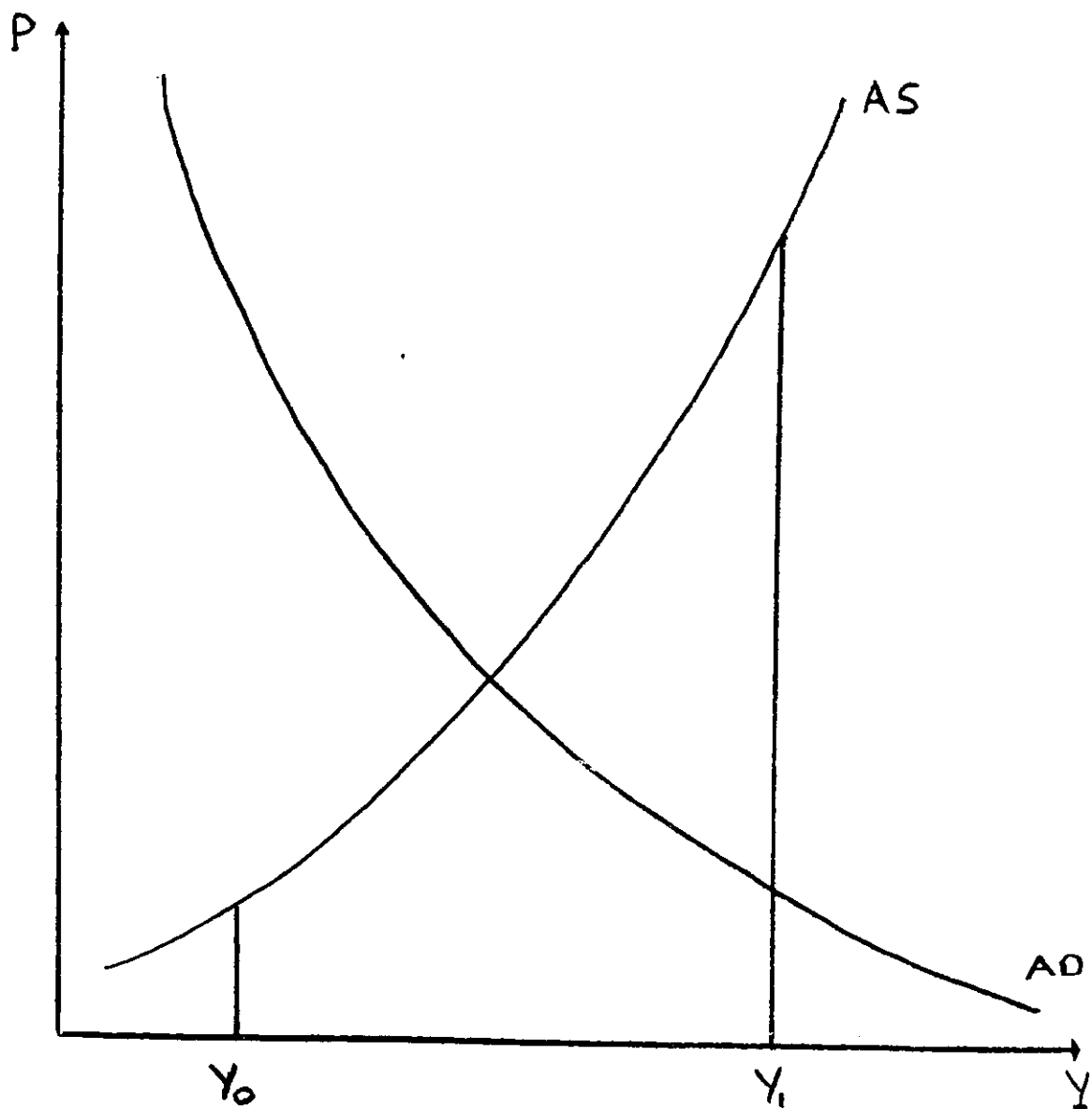


FIGURE 4.5: STATE, PRIVATE AND AGGREGATE SUPPLY

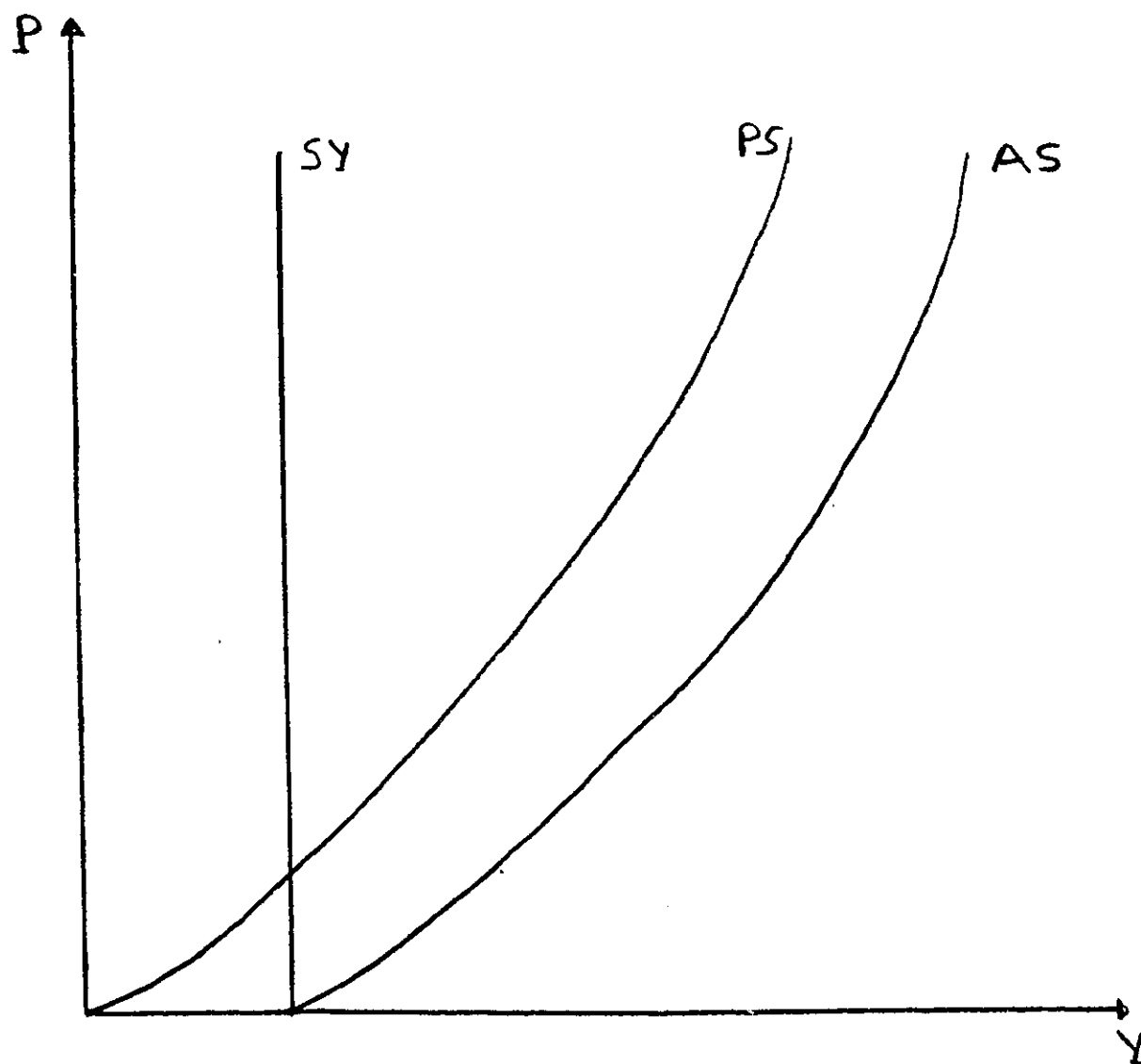


FIGURE 4.6: SUPPLY POLICIES WITH FLAT AGGREGATE SUPPLY

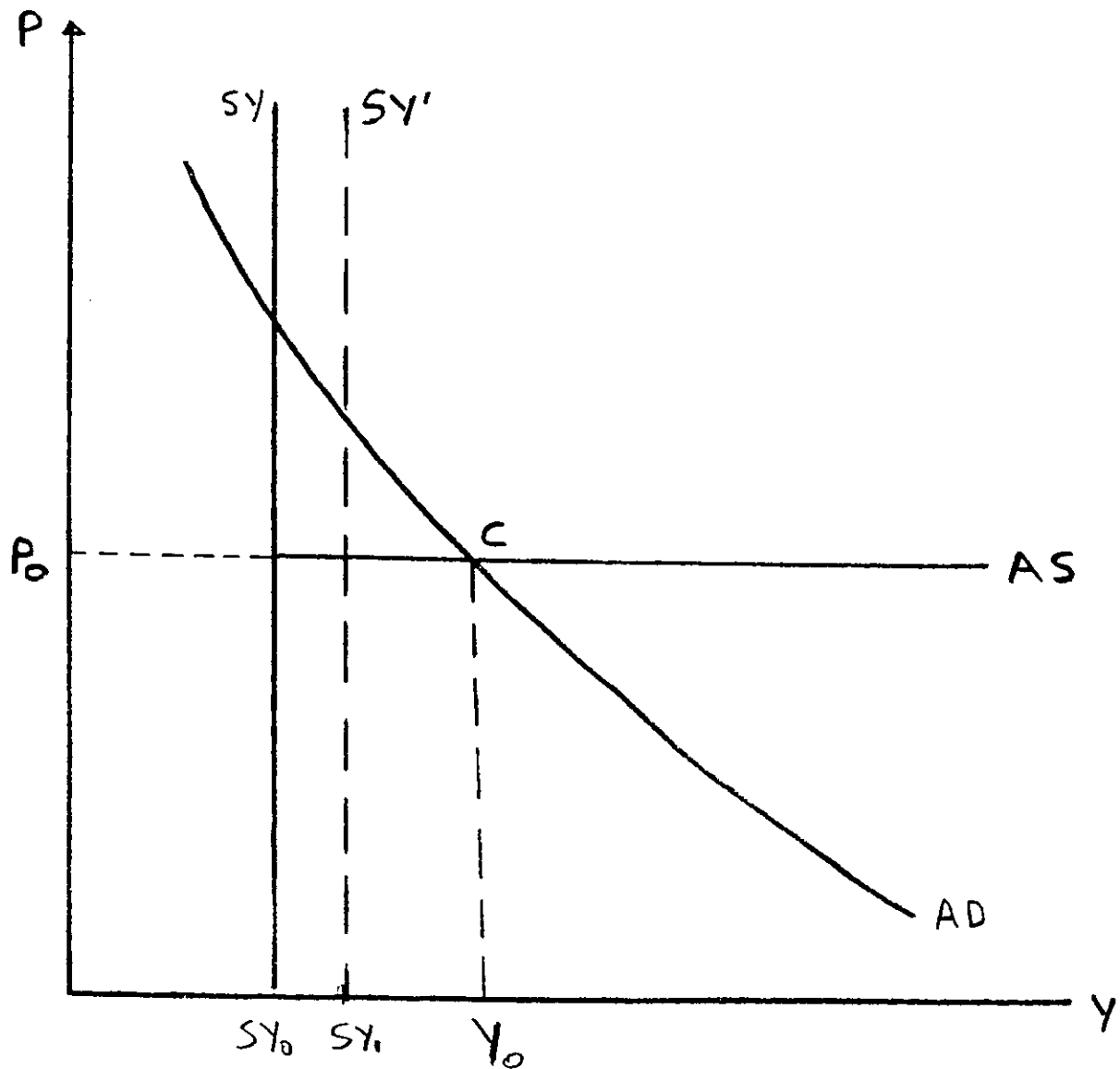


FIGURE 4.7: SUPPLY POLICIES WITH STEEP AGGREGATE SUPPLY

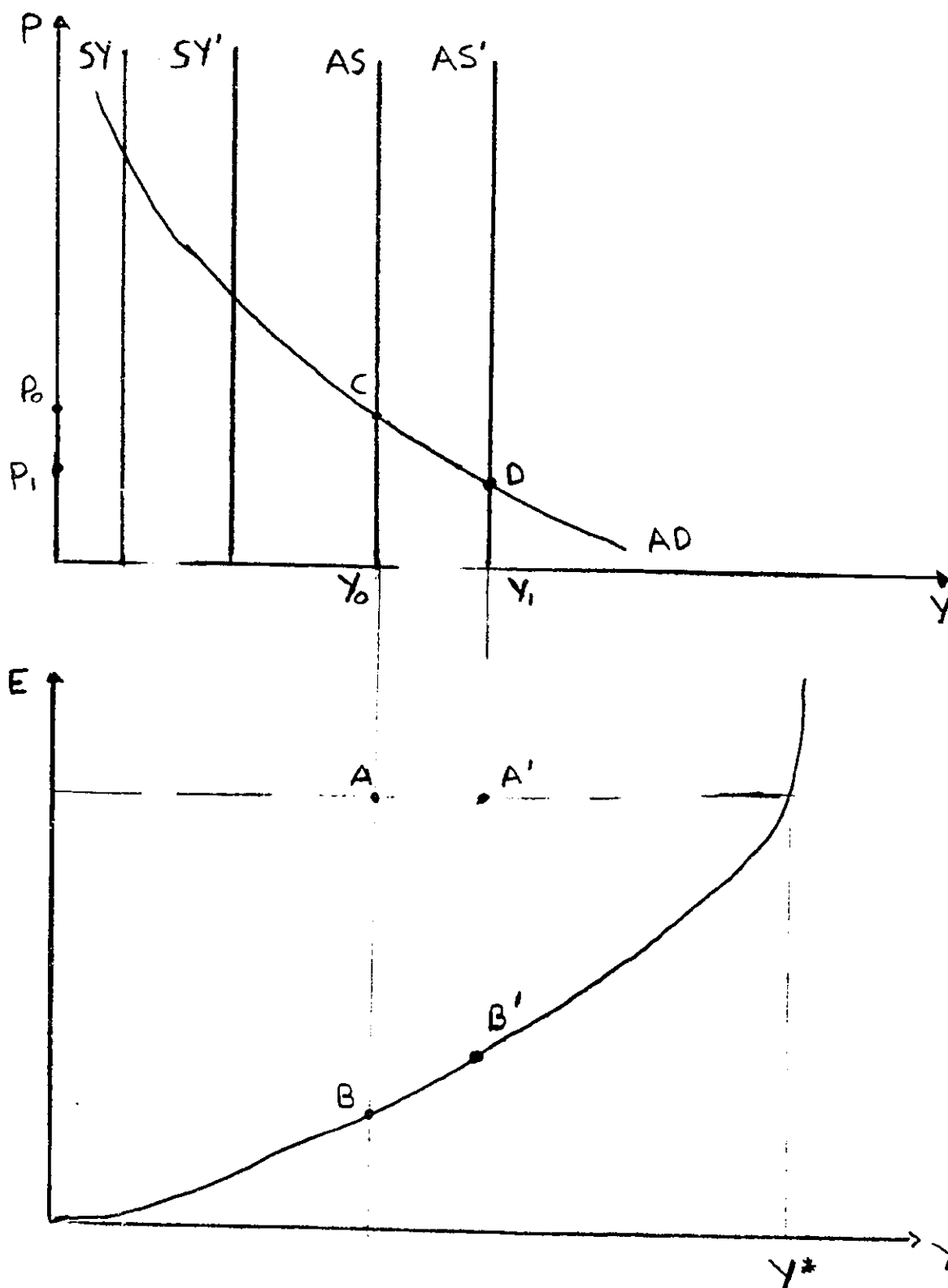


FIGURE 4.8: SUPPLY POLICIES WITH A NORMAL AGGREGATE SUPPLY

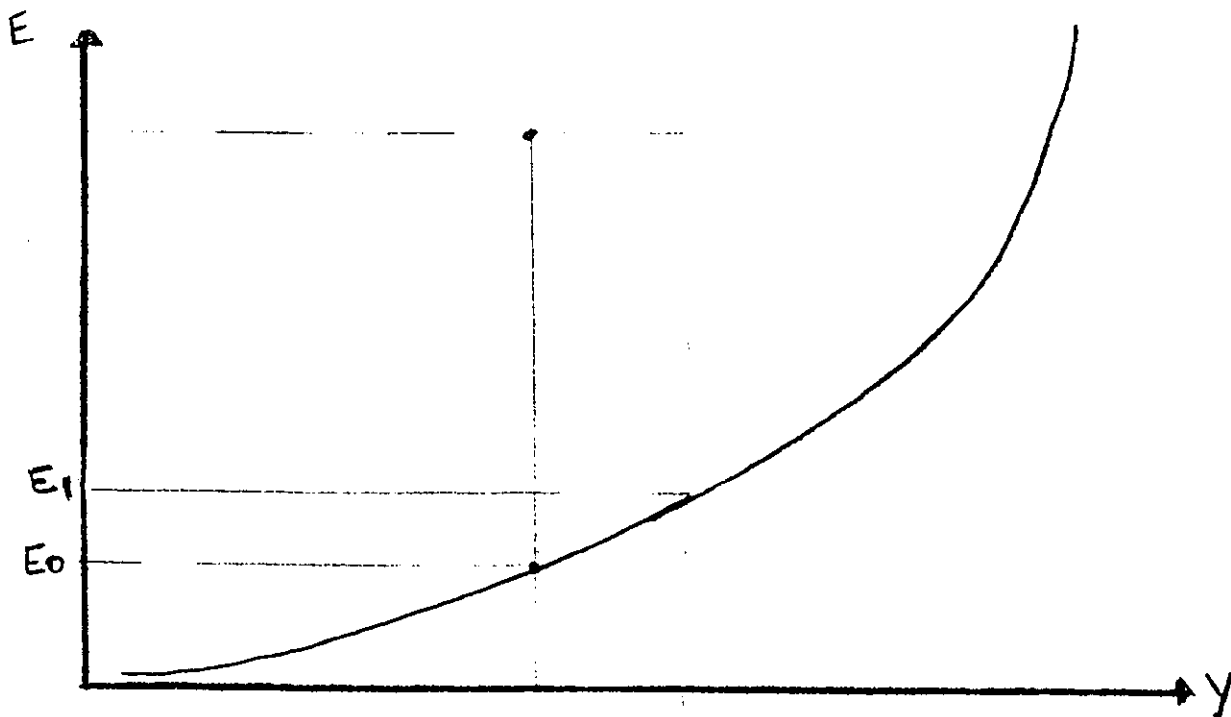
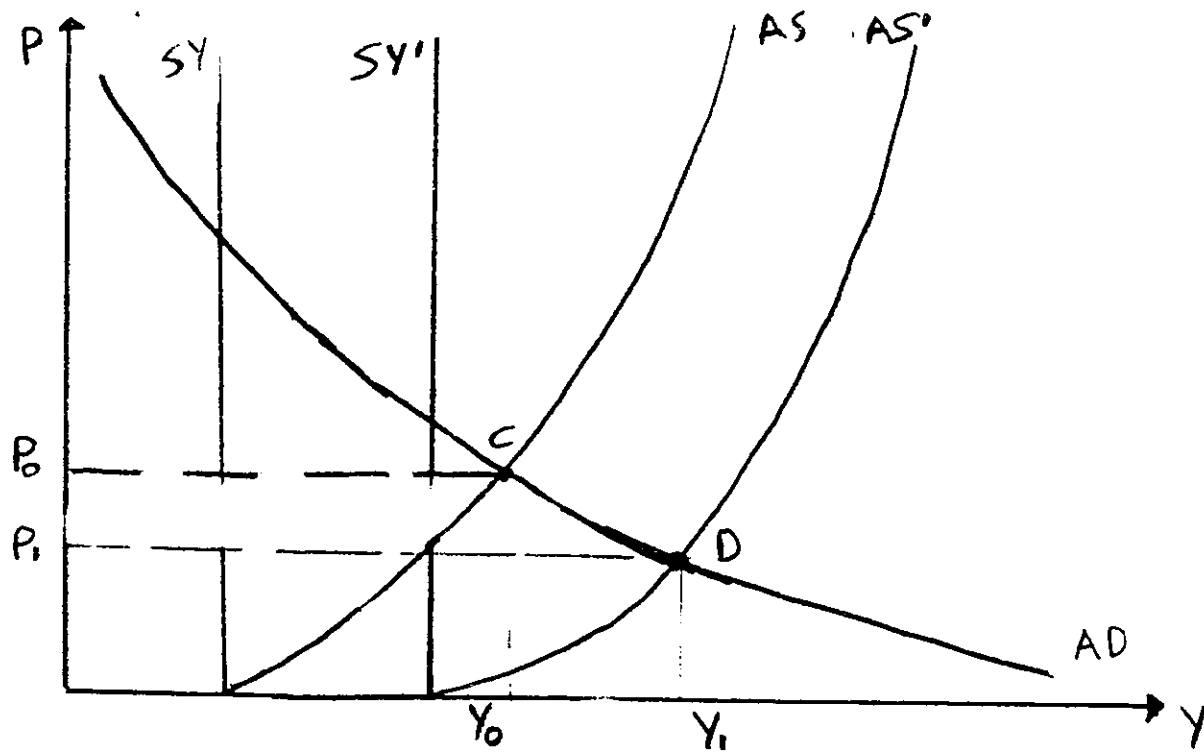


FIGURE 4.9: SUPPLY AND DEMAND POLICES COMBINED

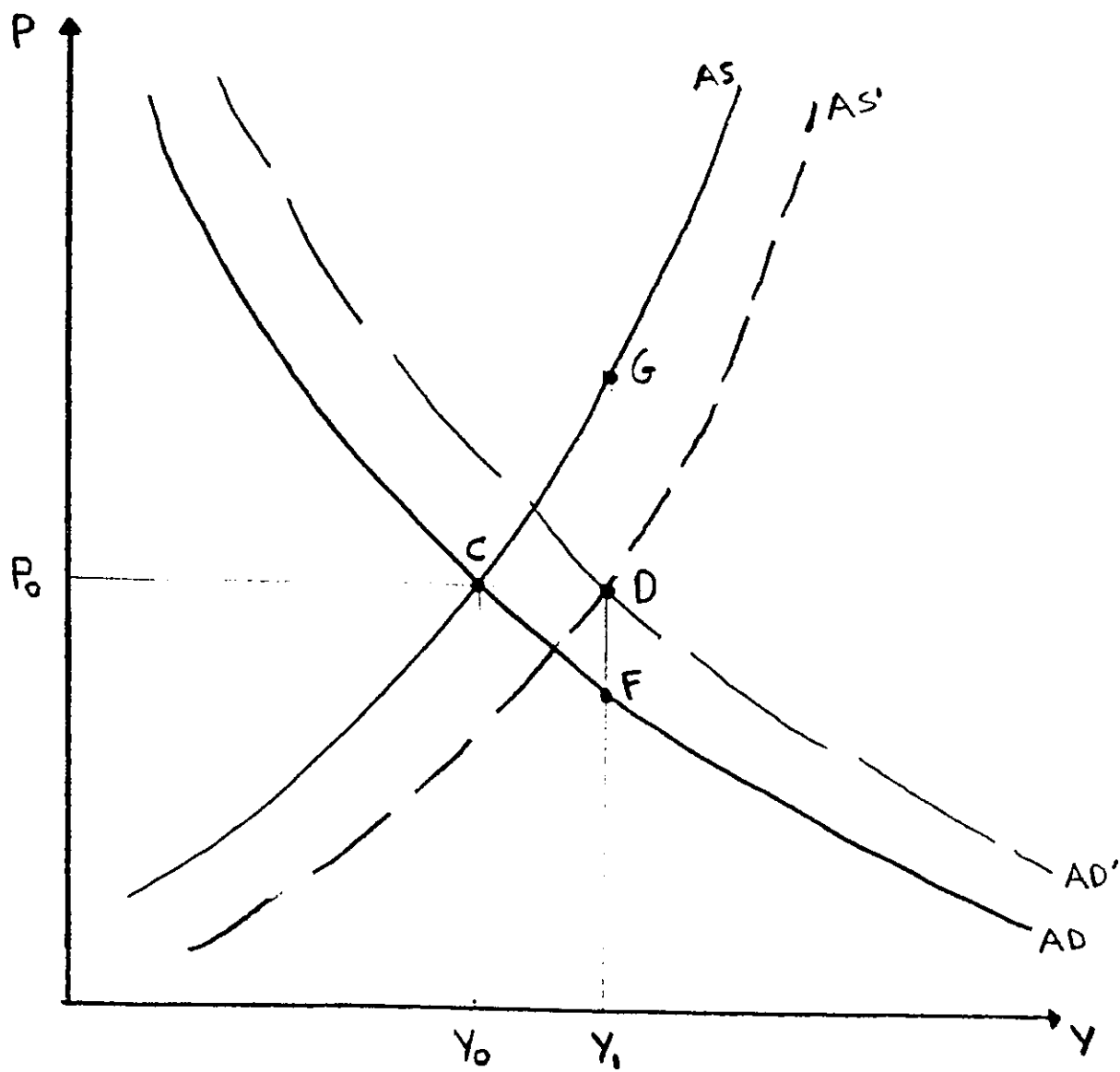


FIGURE 4.10: STABILIZATION POLICIES: SUPPLY SHOCKS

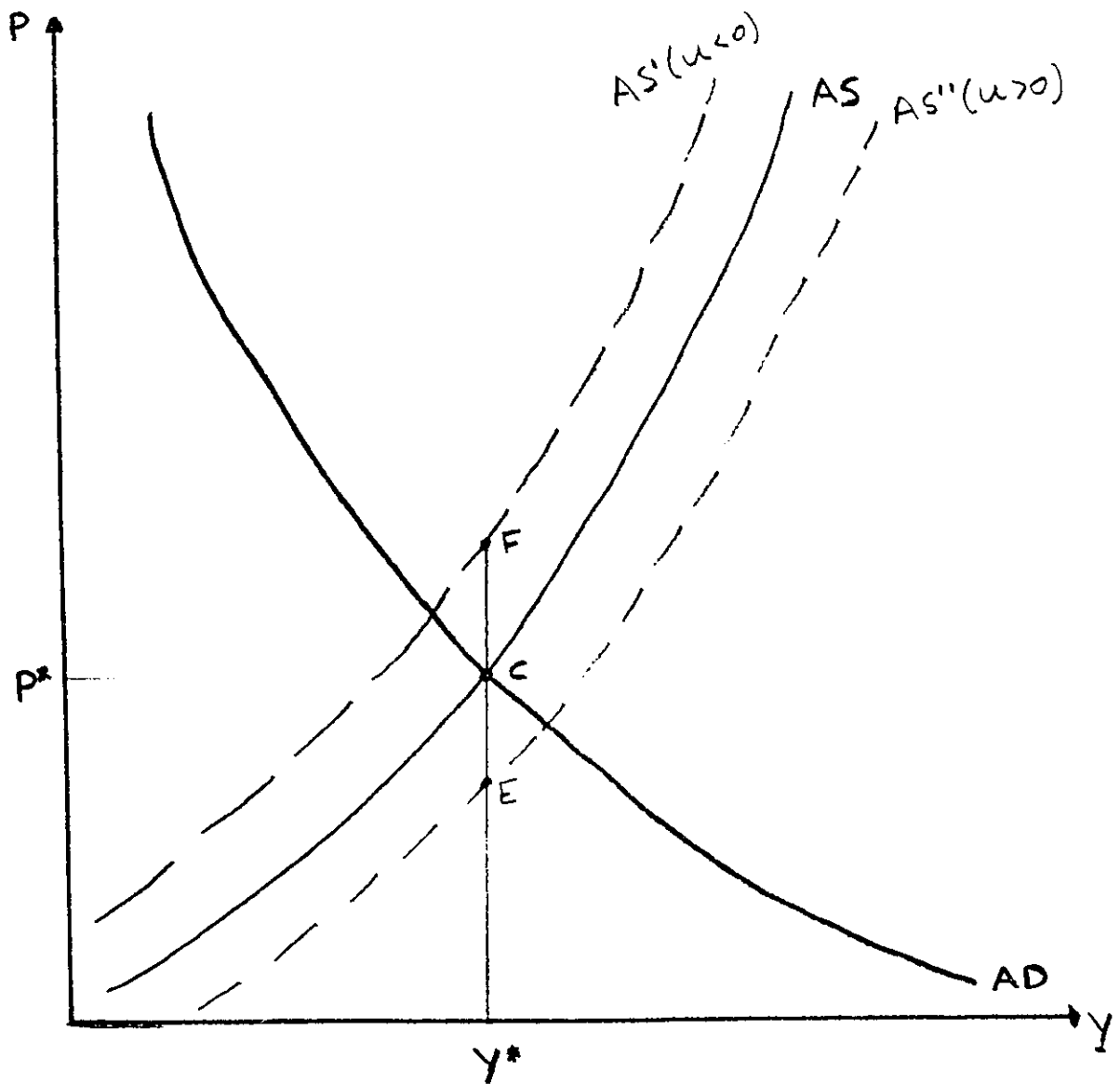


FIGURE 4.11: STABILIZATION POLICIES: DEMAND SHOCKS

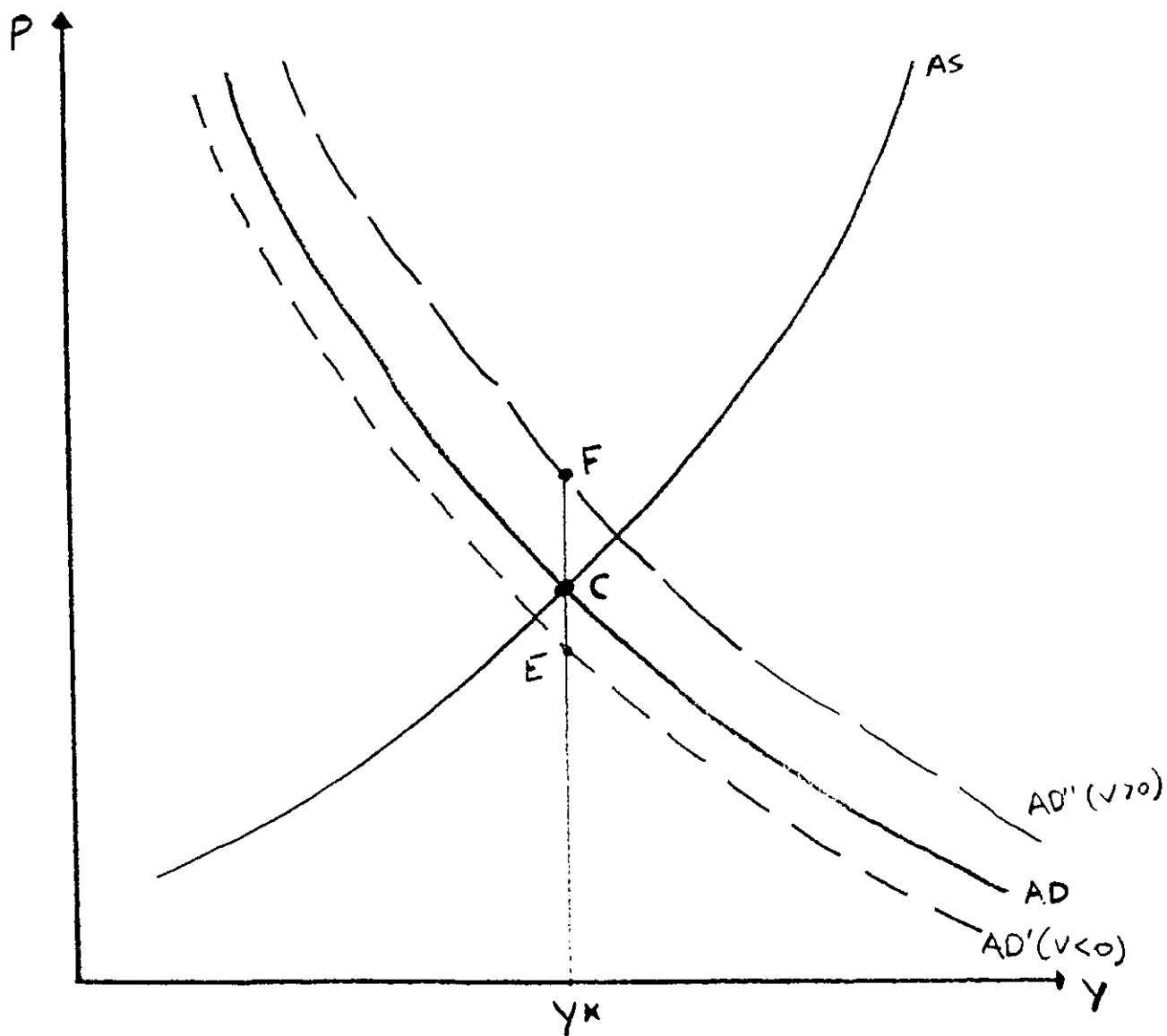


FIGURE 4.12: STABILIZATION POLICIES: MIXED SHOCKS (CASE 1)

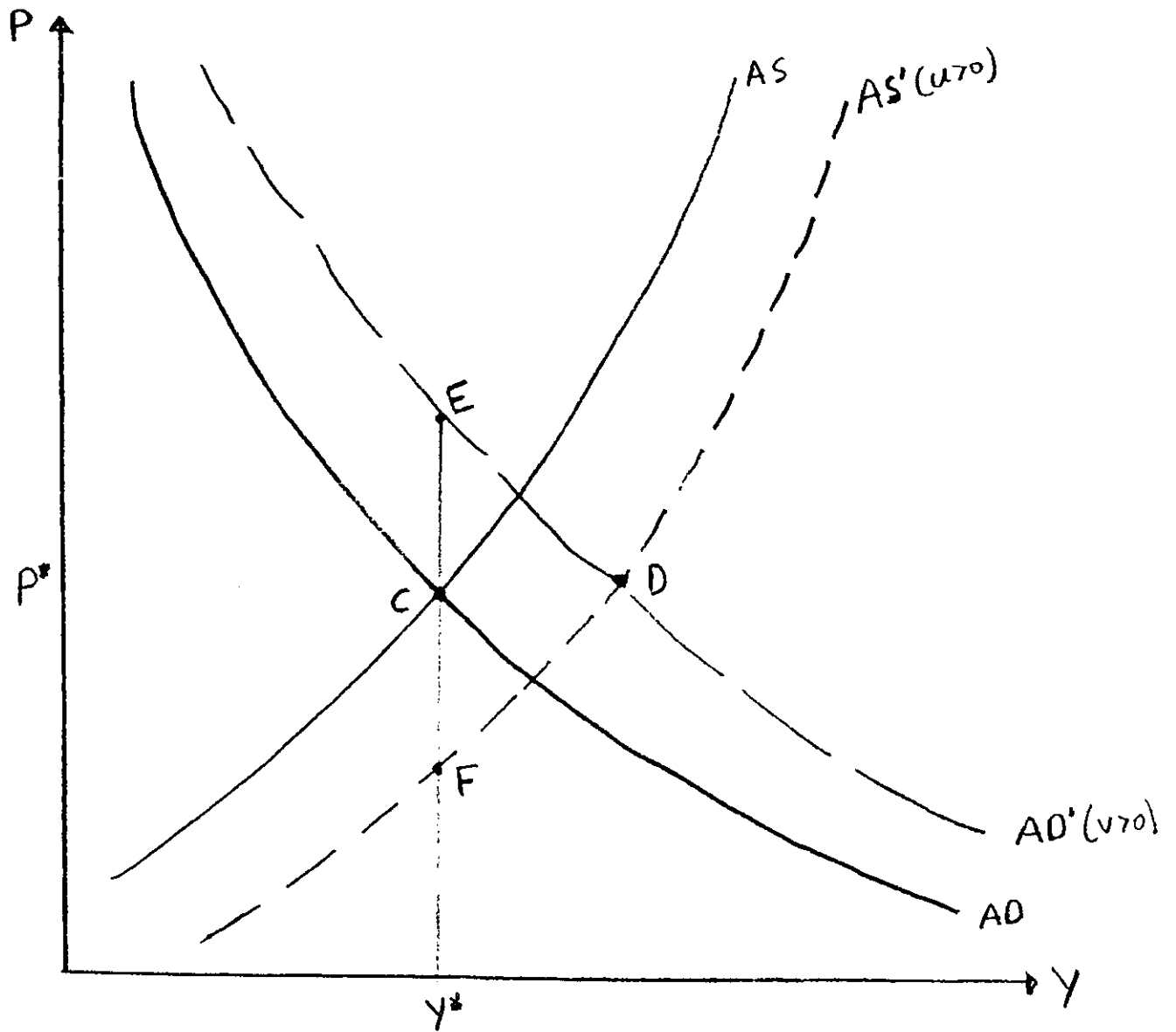
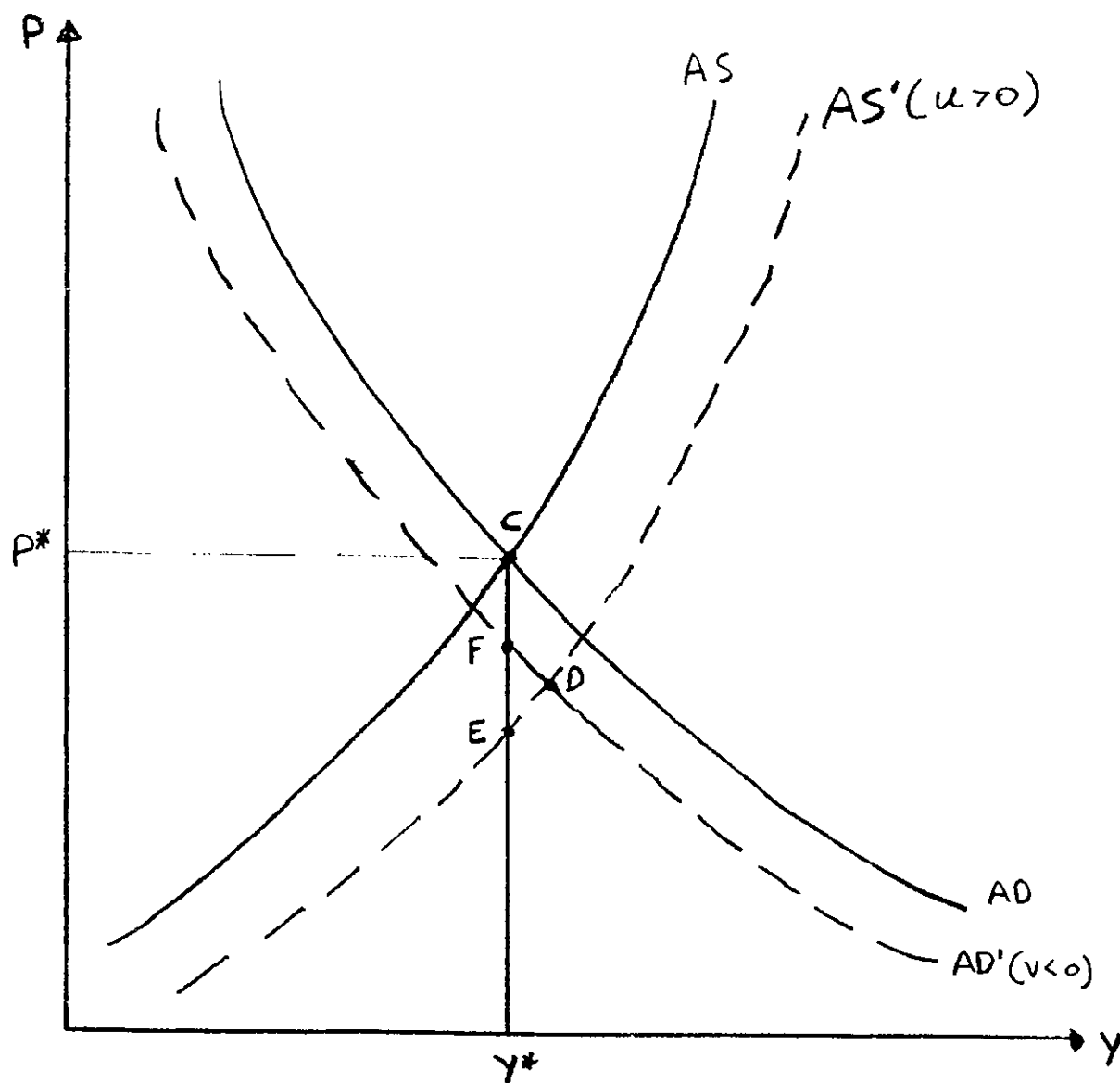


FIGURE 4.13: STABILIZATION POLICIES: MIXED SHOCKS (CASE 2)



C H A P T E R F I V E
MACROECONOMIC POLICY WITH DIRECT AND INDIRECT GOVERNMENT
ECONOMIC INTERVENTION

''Events in the 1970's and 1980's demonstrated to Keynesian
and New Classical Economists alike that Marshall's
celebrated scissors also comes in a giant economy size''
Alan S. Blinder (1987, p. 133)

Introduction

Macroeconomic policy is defined as systematic government economic actions, which aim at re-directing the course of aggregate economic variables, such as employment, growth of output and inflation.(1) The literature on the theory of macroeconomic policy is enormous.(2) However, it appears that the alternative government interventions have not been fully analyzed in the macroeconomic literature.(3) Most

(1) Friedman(1968) defines economic policy as government actions aiming at ''high employment, stable prices, and rapid growth''. Our definition is more general because it does not constrain the direction of effects. For example, in some cases it might be preferable to aim at less than 'rapid' growth or less than 'high' employment.

(2) The theory of macroeconomic policy has been developed by J. Tinbergen in a series of monographs (1952, 1954, and 1967). It was extended by H. Theil (1964 and 1965). Further developments were the contributions by Brainard(1967), M. Friedman(1968), Poole(1970), Lucas(1975 and 1986), and Sargent and Wallace(1976). See also the synthesis and extension by B. Friedman(1978). An elementary survey of economic policy is given by Vane and Thompson (1982). A more advanced exposition is given by Preston and Pagan(1982).

(3) Most of the literature on the theory of macroeconomic policy discusses government interventions on the demand-side. Other types of government interventions that aim at the supply-side, such as public employment, are completely ignored. It is interesting to note that the original contribution by Jan Tinbergen(1952) does mention the possibility of what he calls 'qualitative' policies, which include public enterprises, but he never discussed their effectiveness because these policies involve structural changes. More recently, Modigliani(1977) has argued that there is nothing wrong to work with policies that involve 'structural' changes, which implies that these alternatives should be analyzed. Finally, Peston(1986) has presented a theoretical macroeconomic model for policy analysis that

macroeconomic models for policy analysis emphasize only the demand side of government intervention without even making a distinction between direct government purchases (the government acts as a consumer) and indirect government expenditures (transfer payments).(4) It is important to distinguish between alternative government interventions, because the effectiveness of macroeconomic policy, that so much has been recently debated, may depend on the type of systematic government economic interventions.(5) In this chapter an attempt is made to fill this gap in the literature of macroeconomic policy. A small theoretical model is developed that fully incorporates all systematic government economic interventions.(6) In what it follows in this introduction we give definitions and examples of alternative government economic interventions, the main results obtained, and the structure of this

distinguishes between private and public wages, but the latter becomes an instrument of aggregate demand policy. But public wages imply public employment and therefore public production, which affect aggregate supply. Thus, we cannot have public wages without public output. In the model presented here this distinction is explicitly taken into account.

(4) In most textbooks that deal with macroeconomic policy the government sector is introduced by the variable (G), which is defined as government purchases of final goods and services, see Branson(1979, ch. 3), Dornbusch, Fisher and Sparks(1985, ch. 3) and Sargent(1979, ch. 2). A recent exception has been the textbooks by Barro(1986) and Parkin(1985) but they simply mention public production as a possibility they do not analyze it as an instrument of economic policy. Barro (1986, p.312) is very clear when he states: "We could model public services as the output from the government's production function. Then the inputs in this function would be the government-owned stock of capital, labor services from public employees, and materials that the government purchases from the private sector. Instead, we simplify matters by neglecting production in the public sector. We do this - as do macromodels generally - by pretending that the government buys only final goods and services on the commodity market" (emphasis added). In this work we argue that if we stop pretending that government production does not exist, it might be of great significance in explaining the extent of macroeconomic policy effectiveness.

(5) In the recent past (the last two decades) macroeconomic policy

chapter.

Direct government economic intervention is defined as economic actions that are fully undertaken by the government. On the demand side, this involves the purchase of final goods and services produced either by the private or the public sector. On the supply side, direct government intervention is defined as the provision of goods and services, which includes both the public administration and public enterprises. Typical macroeconomic analysis defines all government expenditures as the former and completely ignores the latter (see footnote 4).

Indirect government economic intervention is defined as systematic government economic actions that aim at affecting the decisions undertaken by the private economic agents. On the demand side, these government actions are defined to include transfers payments to households, such as family allowances, child tax credits, senior citizens tax bonuses, rent subsidies. On the supply side, indirect government intervention might include payroll taxes, capital

has been debated on two grounds. First, there is the old debate on the effectiveness of monetary and fiscal instruments as demand management policies, see the contributions by M. Friedman (1970 and 1971) and the special issue of the Journal of Political Economy in 1972. A good summary of the Monetarist-Keynesian debate is given by Venieris (1977). The recent debate between the New Classical school and the Neo Keynesians has been a more rigorous attack on policy effectiveness and therefore government intervention. Major contributions in this debate are Lucas and Sargent (1978), Lucas (1983, 1986) and Fischer (1977); see also the textbook by Hall and Taylor (1986).

(6) As it is explained in the next section, for simplicity, we do not include a financial sector and therefore important government economic interventions are excluded, such as money supply rules and government bonds. In the literature of economic policy these issues have been extensively debated and there is nothing new that we can add to this debate. This debate is summarized by B. Friedman (1978); other contributions are by Blinder and Solow (1973), Barro (1974), Tobin and Buiter (1976), and Barsky, Mankiw and Zeldes (1986).

subsidies, depreciation allowances, and support for research and development.(7) The indirect government policies differ from the direct ones in one important aspect: the magnitude of the effect on either the demand or the supply side of indirect government expenditures depends on private sector's response.

The distinction we make here between direct and indirect, demand and supply management policies leads to a number of important postulates relating to the effectiveness of government intervention. First, it is quite possible that the structure of the economy is such that demand management policies do not work, i.e., aggregate supply curve is vertical, but where supply management policies can be effective. Thus, the argument of government non-intervention is incomplete, if only demand management policies are considered. Second, we demonstrate then that if private agents response is slow, then indirect government intervention is inferior to direct government intervention. Third, the textbook multiplier tends, in most cases, to either overestimate or underestimate the effectiveness of economic policy. Fourth, as it would be expected, supply side policies are more effective in fighting stagflation than demand management policies. The latter are more appropriate in economic situations of recession. Fifth, the main policy recommendation of this work is not to advocate more or less government expenditures (more or less government intervention), but to present an argument in support of re-structuring government expenditures according to the state of the economy. It is quite possible to have a simultaneous

(7) Very recently, Gylfanson and Lindbeck(1987) discuss indirect demand and supply management policies within the context of a macroeconomic framework.

decrease in government expenditures (an improvement in the budget deficit) and an increase in output and a decrease in inflation. Finally, it is demonstrated that only one type of government intervention, i.e., public employment, crowds out private production in both absolute and relative terms. All other types of government intervention increase private production.

This chapter is divided into five sections. The first section presents a simple theoretical macroeconomic model for a closed economy and without a financial sector. This model specification allows us to concentrate on the effectiveness of the specific government interventions defined in the introduction. In the second section we present three alternative models and analyze their policy recommendations within the framework of direct/indirect and supply/demand management policies. These models are the classical school, the equilibrium Keynesian model and a model with fixed nominal wage rate. We conclude by summarizing the results obtained as well as possible extensions.

2. A Fixed Real Wage Model

In our prototype capitalist closed economy it is assumed that there exist three types of representative agents: households, firms, and government. Firms earn all property income, undertake investment, demand labor and organize production; households consume goods and services and supply labor for a wage, which is their only source of income; finally, the government has a unique role to play in our model: it consumes and invests, it hires labor and produces

output. In addition, the state has the power to intervene indirectly in economic activities undertaken by private agents. This prototype model is a 'real' economy; there is no financial sector. We follow Malinvaud (1977, p. 40) in assuming no interest-bearing asset. Malinvaud has money, but the only role it plays is to transform current excesses of income over consumption into future consumption. In our model money plays a similar role. As Malinvaud assumes, government accommodates any demand for money and it is not used as an instrument of monetary policy. The problem of aggregating households and firms is assumed away. Firms maximize profits, households maximize real consumption and the government maximizes a social welfare function. We assume that all government economic actions are dictated by macroeconomic policy concerns alone. The economy without government intervention is characterized by an excess supply in both the labor and the goods market. It is this feature of the economy that calls for a systematic government intervention in both the demand and the supply side. Actually our purpose here is not to explain the problem of unemployment, but how to formulate policies which may decrease it.(8) The general theory of macroeconomic policy should take these aspects into consideration. The theoretical framework presented in this section takes into account government intervention in both the demand and the supply side of the economy.

The demand side of the economy has behavioural relations for

(8) There are not any adequate explanations as to why disequilibrium exists but this should not prevent the government from acting. It took a long time for the human race to learn the causes of such natural phenomena as rain, snow, heat, cold but this did not prevent men and women from trying to cope with them. Building a shelter to protect one from rain and snow does not require a knowledge of the causes of these phenomena. The worst thing is to assume them away.

private consumption and private investment:

$$(1) \quad C = C(W, P, Gc) \quad 0 < C_1 < 1 \quad C_2 < 0 \quad 0 < C_3 < 1$$

$$\text{where } W = (1-T_1)Wg \quad 0 < T_1 < 1$$

$$(2) \quad I = I(n, Gi) \quad I_1 > 0 \quad I_2 > 0$$

$$\text{where } n = (1-T_2)ng \quad 0 < T_2 < 1$$

The first equation is the private consumption of current goods and services (C). It depends on real disposable wage income (W), the price level (P) and indirect state expenditures to affect private consumption (Gc). (9) Real disposable wage income (W) is equal to gross wage income (Wg) minus the tax on wage income given by the (T₁) tax rate. The latter can include such things as food subsidies, family allowances, and other transfers of income to households. The values as well as the signs of the partial derivatives are of importance to the conclusions drawn later. These derivatives are assumed not to be constant, but as changing in response to changes in the economic environment. (10)

The partial derivative for real disposable wage income in the private consumption function is assumed to be greater than zero but less than one. In this simple economy households do not invest, but they can always postpone current consumption, which makes the

(9) All variables are expressed in real terms except the price index (P) and the nominal wage rate (w).

(10) This takes into consideration Lucas's (1975) critique but it is a more general problem. Lucas assumed that the parameters of the model change with any change in government policy. However, the parameters change with any change in the economic environment, such as a drastic increase in the price of an important commodity, i.e., oil, or a period of recession. All these are expected to change people's tastes, the choice of technology and attitudes towards uncertainty, which are the parameters of the model.

marginal propensity to consume less than one.(11) The price partial derivative (C2) is less than zero because an increase in the price level decreases real wealth and therefore consumption. In this model wealth is equal to the past accumulation of the one good in the economy. At any given period of time past accumulations of the single good are fixed and the current level of price determines the real value of wealth in the current period.(12)

The partial derivative of indirect government expenditures to assist private consumption(G_c) is assumed positive and less than one. Since, in one way or another, these types of government expenditures involve transfers of income, they cannot increase current consumption by more than the transfers. This is not true if government transfers and private expenditures are complementary. We assume, however, that these transfers have no other effect but to increase the spending ability of households. The private response to indirect government expenditures (C3) depends very much on people's expectations on future taxes.(13) Profits do not affect consumption because we assume

(11) It has been shown by Barsky, Mankiw and Zeldes(1986) that an increase in uncertainty may decrease the marginal propensity to consume by increasing precautionary savings.

(12) The price level may be introduced in the consumption function based on the empirical evidence. Branson and Klevorick(1968, p. 832) have demonstrated that '...irrationality may exist in the short run and in which there are difficulties associated with the collection and interpretation of reliable information. Hence, while in the long run we might expect to find people free of money illusion, it is not so clear that in the short run we may expect to find consumers' total real consumption demand homogeneous of degree zero in prices, money income, and money wealth.'

(13) In this case we can follow Friedman in considering wage-income as permanent wage-income. An increase in current transfers can be seen as a future increase in taxes of equal present value. Thus, net permanent wage-income decreases if we assume that the transfers programs have some costs of operation. At the extreme consumption may decrease. However, as Barsky, Mankiw, and Zeldes(1986, p. 677) have shown current consumption might increase '... due to the reduction in precautionary saving when the government, by reducing the variance of

that these do not accrue to households.

The second equation is for private investment(I). In this case, it is assumed that out of income only real disposable profits(n) affect investment.(14) Real disposable profits are defined as gross profits(ng) minus the tax on profits. Notice that the tax rate on profits (T2) need not be equal to the tax rate on wage income (T1). Private investment is also affected by indirect government expenditures(Gi). These policies can be subsidies to capital, depreciation measures, tax concessions, assistance for research and development, etc. Both partial derivatives of the investment function are positive. The profit partial derivative(I1) is positive because an increase in profits will increase investment. However what is important is whether or not the value of (I1) exceeds one. In other words, does a one dollar increase in profits increase investment by more or less than a one dollar? The value of (I1) plays an important role in the multiplier analysis of this chapter. It is expected that the value of (I1) will be relatively high when the economy is booming and relatively low (close to zero) when the economy is in a recession.

The partial derivative(I2) shows the responsiveness of the private sector's investment to indirect state expenditures. This coefficient can be greater than one if indirect state expenditures are complementary with private investment. Thus, a one dollar increase in

future income, provides insurance to individuals that is not available in the private market.'

(14) The interest rate is related to the profit rate since the worst alternative a firm has is to lend its own profits at the market rate of interest. We do assume that the economy's profit rate cannot be less than the interest rate. An individual firm may have a profit rate below the interest rate but the overall profit rate is larger.

government expenditures may increase private investment by more than one dollar.

The supply side of the economy is described by three relations. We assume that labor is of unlimited supply and that employment is demand-determined. Actually, policy-makers can guarantee the unlimited supply by such policies as immigration in the short run and population policies in the long run. This is the result of our assumption of permanent excess supply in the labor market. The supply relations are given as follows:

$$(3) L = L(P, G_s) \quad L_1 > 0 \quad L_2 > 0$$

$$(4) N = L + L_g$$

$$(5) Q = Z(L + L_g) \quad z = Z' = dQ/d(L + L_g) > 0, \quad Z'' < 0$$

Where $z = Z' =$ Marginal Product of Labor

An increase in the price level increases profits and therefore output and in the short-run this can be only done by an increase in the employment of labor (see the appendix). The private demand for labor is positively related to government expenditures to assist labor employment in the private sector (G_s). These policies can include government expenditures for training allowances, subsidies to hire various groups of the population (youth, women, and minorities), pension plans, etc.

The total demand for labor (N) is the sum of the endogenous private employment (L) and the policy determined government employment (L_g). The state labor demand (L_g) is a direct government policy on the unemployment problem. To reduce unemployment, policy-makers can

increase L_g . Given that employment is demand-determined, it is assumed that the government sets L_g such that total labor demand is always less than total labor supply.⁽¹⁵⁾ There is always some unemployment.

Equation (5) is a standard short-run aggregate production function. The only difference is that it is a function of both private and state labor. Since this is a one good model, both the private and the state sector use the same technical relation. This enables us to focus on the policy aspects of public production and we abstract from the problem of efficiency.

Finally, the model can be completed by the equilibrium conditions and the process by which government revenue and nominal wages are determined:

$$(6) \quad Y = C + I + C_g + I_g$$

$$(7) \quad Y = W + n + T$$

$$(8) \quad T = T_1 W_g + T_2 n_g \quad 0 < T_1, T_2 < 1$$

$$(9) \quad w = kP \quad k > 0$$

$$(10) \quad W = (w/P)(L + L_g)$$

$$(11) \quad Y = Q$$

Equation six equates total expenditures to total income (output).

(15) The model excludes situations, such as wartime, where this assumption may not hold but where the wage may be controlled by wage-price guidelines.

Total income(Y) is equal to private consumption(C) and investment(I) and the direct government expenditures($C_g + I_g$) on the demand side. The state variables are the direct state consumption(C_g) and direct state investment(I_g). These types of government expenditures are used to purchase directly goods and services. They are different from the indirect government expenditures because the latter is simply a transfer of income from the government sector to the private sector. Both state consumption and state investment respond to policy considerations alone. They are set by the policy-makers taking into consideration the level of private consumption and investment. Thus, they are policy determined and therefore are taken as given. Indirect state expenditures are not included because they are already part of the corresponding private variables. We should note here that equation six shows that an economy without government intervention will result to an excess supply in the product market. In other words, if C_g and I_g are equal to zero, then private aggregate demand ($C + I$) will be less than aggregate supply. Equation seven gives the decomposition of national income into wages(W), profits(π) and government revenue(T). The latter is determined by equation eight as a function of wage and profit income.

Equation (9) states that the real wage rate (after taxes) is fixed. It is determined outside the economic system. Radical economists have postulated that it is determined by social and historical conditions (usually set equal to the subsistence level) and the struggle between capitalists and workers. Non-radical economists have also found that the assumption of fixed wage rate is

a good approximation of reality.(16)

Equation (10) is an identity: total real wages (W) are equal to total employment multiplied by the real wage rate. Equation (11) is an equilibrium condition which states that aggregate demand should be equal to aggregate production. The system of eleven equations can be used to solve for the 11 endogenous variables: C , I , L , n , P , T , w , W , N , Q , and Y . In the next section we solve the model for the two most important aggregate economic relations: aggregate demand and aggregate supply.

2.1 Aggregate Demand and Aggregate Supply

The equations of the theoretical framework presented in the previous section can be used to analyze the aggregate demand and the aggregate supply relations. Since we are using general functions, these relations cannot be explicitly derived, however, given that macroeconomic policy is concerned with small (differential) changes in the variables, we can totally differentiate equations 1 to 10 to analyze the differential change in the aggregate supply and aggregate demand relations.

$$(1') \quad dC = C1dW + C2dP + C3dGc$$

$$(2') \quad dI = I1dn + I2dGi$$

$$(3') \quad dL = L1dP + L2dGs$$

$$(4') \quad dN = dL + dLg$$

(16) See Hall and Taylor (1986) and Bruno and Sachs(1985).

$$(5') \quad dY = z d(L+L_g) = z dL + z dL_g, \quad z = \text{Marginal Product of Labor}$$

$$(6') \quad dY = dC + dI + dC_g + dI_g$$

$$(7') \quad dY = dW + dn + dT$$

$$(8') \quad dT = T_1 dW_g + T_2 d n_g$$

$$(9') \quad dW = k dP$$

$$(10') \quad dW = (w/P) d(L+L_g)$$

$$(11') \quad dY = dQ$$

From (5'), (9') and (10') we obtain:

$$(12) \quad dW = k z dQ$$

Substituting (12) and (8') and the definition of W_g and n_g into (7') and solving for dn we get:

$$(13) \quad dn = (1-T_2) dY - \frac{kz(1-T_2)}{(1-T_1)} dQ$$

The total differential of aggregate demand is derived by substitution into (6') using equations (1'), (2'), (12) and (13) and solving for dY :

$$(14) \quad dY = \frac{C_2}{1-I_1(1-T_2)} dP + \frac{C_3}{1-I_1(1-T_2)} dG_c + \frac{I_2}{1-I_1(1-T_2)} dG_i + \\ + \frac{I_2}{1-I_1(1-T_2)} (dC_g + dI_g) + \frac{(1-T_1)C_1 k z - z k I_1(1-T_2)}{(1-T_1)(1-I_1(1-T_2))} dQ$$

Equation (14) is the total differential of the aggregate demand relation. Changes in aggregate demand depends on changes in the price level, the supply of output and all the demand management policies. Notice that the demand for output can not be derived independently of the supply of output. The reason is that the supply determines the level of the wage income which in turn affects aggregate demand.

Aggregate demand is negatively sloping if the numerator of the

price differential is positive because (C2) is negative. The sign of the coefficient depends very much on the value of (I1), i.e., firms' investment reaction to an increase in profits.

The total differential of aggregate supply can be derived by substituting equation (3') into (5'):

$$(15) \quad dQ = zL1dP + zL2dGs + zdLg$$

The slope of aggregate supply function is:

$$dP/dQ = 1/zL1 > 0$$

The differential of the aggregate supply of output depends on changes in the price level and in the indirect and direct supply policies. The slope of aggregate supply can be very steep (at the extreme becomes vertical), as $zL1$ tends to infinity. The slope of aggregate supply can be very flat (at the limit horizontal), if the value of $zL1$ becomes very small, close to zero. At very low levels of employment, the marginal product of labor is very large, which makes aggregate supply very flat. The opposite is true for high levels of employment.

The other two variables in the aggregate supply function are the direct state labor demand policies (Lg) and the indirect state policies (Gs) to assist labor employment in the private sector. The coefficients of both variables are non-negative, but the coefficient of indirect policies can be very small, if the firms' response to indirect supply management policies ($L2$) is very small. Notice that this is not the case for the direct supply management policies. Their coefficient cannot be zero because the marginal product of labor is always positive.

2.2 Indirect and Direct Policies

In the previous section, we derived the aggregate demand and supply functions. These two functions can be used to solve for the differential equilibrium level of output. Using (15), substitute for the differential of price in (14) and solving for the differential of the equilibrium level of output, we get:

$$(17) \quad dY = - \frac{zL2(1-T1)C2}{A} dGs - \frac{zC2(1-T1)}{A} dLg + \frac{zL1(1-T1)C3}{A} dGc \\ + \frac{zL1(1-T1)I2}{A} dGi + \frac{zL1(1-T1)}{A} (dCg + dIg)$$

where $A = (1-T1)zL1(1-I1(1-T2)) - C2(1-T1) + zL1kz(I1(1-T2) - C1(1-T1))$

Equation seventeen specifies the total differential of the equilibrium level of output. The changes in the equilibrium level of output depends on a number of parameters from both the demand and the supply side of the economy. In addition, it depends on the changes in all six government policies (direct and indirect) on both the demand and the supply side of the economy. The equilibrium level of output can be used to determine the extent to which alternative government policies are effective.

First, we examine the effect of indirect policies. The equilibrium level of output depends on all three indirect policies. There are two policies that affect the demand side of the economy. Government can indirectly affect the consumption behaviour of the private sector through transfer payments (Gc) and the investment behaviour of the firms (Gi). Indirect supply management government policies (Gs) can increase the private demand for labor. From (17),

the change in the equilibrium level of output with respect to G_c , G_i , and G_s is:

$$(18) \quad \frac{dY}{dG_c} = \frac{zL_1(1-T_1)C_3}{A} > 0$$

$$(19) \quad \frac{dY}{dG_i} = \frac{zL_1(1-T_1)I_2}{A} > 0$$

$$(20) \quad \frac{dY}{dG_s} = - \frac{zL_2(1-T_1)C_2}{A} > 0$$

These three expressions are the multipliers of indirect government expenditures directed towards private consumption, private investment, and private employment respectively. All multipliers are positive. All parameters are positive except C_2 . However, more important for all multipliers is not if they are positive, but how large they are. The effect of each multiplier depends very much on key structural parameters. The indirect demand multipliers depend on private sector's response to government expenditures to affect aggregate consumption and aggregate private investment (C_3 and I_2). If C_3 and I_2 are equal to zero, then the indirect demand management policies have no real effect.

The multiplier of the indirect supply management policies is given by equation (20). Indirect supply policies depend on the relative response of the private sector's labor demand per unit change in government expenditures to assist private employment (L_2). The higher this response coefficient, the larger the effectiveness of this multiplier.

The equilibrium level of output depends on the effectiveness of indirect policies as well as the effect of direct policies. Direct policies can aim at total consumption, investment and employment. The state can have an effect on these variables by undertaking these economic activities itself. The relative effects of direct demand and supply policies are given by:

$$(21) \quad \frac{dY}{dC_g} = \frac{dY}{dI_g} = \frac{zL_1(1-T_1)}{A} > 0$$

$$(22) \quad \frac{dY}{dL_g} = - \frac{zC_2(1-T_1)}{A} > 0$$

Both direct demand management multipliers and the supply management multipliers are positive. The consumption multiplier is the same as the investment multiplier. Both affect output by the same proportions.

The indirect investment multiplier can be greater than the direct one. As we said above, private investment might increase more than the assistance by the government sector. Matching policies by the government sector can cause this effect.(18) In this case I_2 is higher than one and the indirect multiplier is greater than the direct multiplier. The same is not true for consumption and for investment if I_1 is already too large. Thus, the overall demand effect by indirect government expenditures is lower than the direct effect. Thus, the effect of demand management policies may depend very much on the types of government expenditures (direct and

(18) Matching policies are those which private investment is financed by the government sector, i.e., the state matches one dollar private investment with one dollar assistance.

indirect). Apart from the private response to government expenditures, there is no other difference between the direct and indirect demand multipliers. Thus, the same factors that determine the level of the indirect multipliers determine the level of direct multipliers as well.

The direct supply multiplier is given by equation 22. The effectiveness of the direct supply multiplier depends on the marginal product of labor(z), the price effect on consumption(C_2), the tax rate on wage income(T_1) and the parameter A which includes all the structural coefficients of the model. The extent of the effectiveness of the direct supply multiplier depends on the marginal product of labor. A higher marginal product of labor(z) implies a more effective supply management multiplier.

Is it possible for neither policy (supply and demand) to work? This will render government economic intervention completely useless if not harmless. The answer is 'yes' and it depends on the slopes of aggregate supply and demand. If both curves are very steep then, economic policy has little effect on the level of output and most of adjustments are being made through the price level.

The value of the five multipliers (three for indirect government expenditures and two for direct government expenditures) presented above depends on a number of parameters that their value cannot be considered constant. As we have already mentioned two parameters are very important: the firms' investment response to profits(I_1), and the constant real wage rate (k). The value of these parameters depend on the state of the economy. Government actions (direct or indirect) that aim at improving the state of the economy may affect

the value of these parameters (see footnote 10 of this chapter). However, a change in the value of these parameters may influence the effectiveness of government policies, i.e., the government expenditures multipliers. In what follows we analyze the effect of the two parameters on the direct government expenditures multipliers. The results are similar for the indirect government expenditures multipliers of both the demand and the supply side.

For simplicity call the demand and supply multipliers of 21 and 22 as demand multipliers (DM) and supply multipliers (SM). Then the first derivative of DM and SM with respect to (k), and (I1) gives:

$$\begin{aligned} \frac{d(DM)}{dk} &= - \frac{zL1(1-T1)}{A^2} \frac{dA}{dk} & \frac{d(DM)}{dI1} &= - \frac{zL1(1-T1)}{A^2} \frac{dA}{dI1} \\ \frac{d(SM)}{dk} &= - \frac{zC2(1-T1)}{A^2} \frac{dA}{dk} & \frac{d(SM)}{dI1} &= - \frac{zC2(1-T1)}{A^2} \frac{dA}{dI1} \end{aligned}$$

where:

$$dA/dk = zL1z(I1(1-T2)-C1(1-T1)), \quad dA/dI1 = zL1(1-T2)(zk+T1-1)$$

Notice that exactly the same results (similar to k) can be obtained if we have an increase in the exogenous factors (a) in the equation of the nominal wage determination.

The effect of the constant real wage rate (k) depends on whether the marginal propensity to consume (C1) is greater or less than the marginal propensity to invest out of profits (I1). If the marginal propensity to consume is lower or equal to I1, then for a given tax-rate, an increase in k will decrease the demand multiplier. If the

marginal propensity to consume is higher than the marginal propensity to invest out of profits, then the effect of an increase in k is negative. However, even in this case the effect may remain the same if the marginal propensity to consume is not very large, or if the marginal propensity to invest is not very low since $C1$ cannot be greater than one and is expected to remain relative constant. If the marginal propensity to consume($C1$) is greater than the marginal propensity to invest out of profits($I1$), then an increase in k increases the supply multiplier. If $C1$ is less than $I1$, then an increase in (k) decreases the supply multiplier.

The second parameter of interest is the marginal propensity to invest out of profits. This parameter reflects business reactions to a number of variables that economic analysis cannot easily model. How much firms decide to invest out of profits may depend on such variables as 'animal spirits', firms' view on the future of the economy, firms' views on the role of government (current and future), etc. It is very important to show how policy effectiveness oscillates for given changes in firms' decisions to invest out of profits.

As it can be seen from the derivative of demand multipliers (DM) and the supply multipliers (SM) with respect to $I1$, the effect of a change in $I1$ cannot be determined without further assumptions. However, the effect of $I1$ on the supply multiplier is opposite to the effect of $I1$ on the demand multiplier. An increase in the marginal propensity to invest out of profits ($I1$), increases (decreases) the supply multiplier (the demand multiplier), if $(zk+T1)$ is greater than one. If it is less than one, then an increase in $I1$ decreases (increases) the supply multiplier (demand multiplier). infer that the effect of $I1$ is similar to both the demand and the supply

multiplier. If we assume that labor is being paid its marginal product so that $z = k+a$, then an increase in the marginal propensity to invest out of profits will decrease both the demand and the supply multipliers. One possible explanation is that when the private sector is booming (I_1 is large), then direct government intervention is not appropriate because it will crowd out what already the private sector is willing to undertake. On the other hand, if profits are not invested (I_1 is low), then the effectiveness of government intervention is increasing simply because the government plays a role that for various reasons the private sector is not willing to play. This role is capital accumulation and therefore growth.

2.3 Stabilization Policy

Up to the 1970s the main concern of policy-makers was economic growth and employment. In the 1970s and the 1980s the inflation rate and the budget deficit was added in the set of policy objectives. It would be of interest to show how the alternative government policies may be used to solve the problem of stagflation and budget deficit. In addition, in this section we discuss the effect of government policies on private output, which in the literature of macroeconomic policy has been called the crowding out effect.(19)

Contrary to the effect on output, demand and supply policies (direct or indirect) do not have the same effect on the price level. Using the total differentials of aggregate demand and aggregate

(19) Blinder and Solow(1973) have discussed different dimensions of the crowding out problem. In our model financial crowding out cannot occur.

supply we can solve for the total differential of equilibrium price level:

$$dP = \frac{(1-T_1)C_3}{A}dG_c + \frac{(1-T_1)I_2}{A}dG_i + \frac{zL_1(1-T_1)}{A}(dC_g+dI_g) - \frac{L_2(1-T_1)C_2+L_2A}{AL_1}dG_s - \frac{C_2(1-T_1)+A}{AL_1}dL_g$$

What is the effect on prices of a change in each of the six policy variables? An increase in the four demand management policies (G_c , G_i , C_g , and I_g) have a positive effect on the price level:

$$\frac{dP}{dG_c} = \frac{C_3(1-T_1)}{A} > 0 \quad \frac{dP}{dG_i} = \frac{I_2(1-T_1)}{A} > 0 \quad \frac{dP}{dC_g} = \frac{dP}{dI_g} = \frac{zL_1(1-T_1)}{A} > 0$$

It appears that in inflationary periods demand management policies are not appropriate. However, supply side policies, direct or indirect, have a negative effect on the price level:

$$\frac{dP}{dG_s} = \frac{-L_3A}{L_2(A-B)} < 0 \quad \frac{dP}{dL_g} = \frac{-zBA}{A-B} < 0$$

Thus, an increase in government intervention in the supply side decreases the price level and therefore the inflation rate. If we combine the price and output effect of supply management policies, then they appear to be the most appropriate policies for stagflation. On the other hand, in situations of recession (deflation and unemployment) demand management policies appear to be more appropriate because the price and output effect move in the same direction.

As we have already mention, another important macroeconomic policy

issue is the effect of government economic intervention on aggregate private economic activity, i.e., the crowding out effect. Since in the short-run, changes in private output are the result of changes in private employment it is easier to look at the latter. From equation (7') we can solve for the change in private labor employment:

$$dQ = z d(L+L_g)$$

$$\text{or } dQ = dQ/z - dL_g$$

Given that all demand management policies (C_g , I_g , G_c , and G_i) and indirect supply management policies (G_s) have a positive effect on output, then an increase in these types of government intervention raise output ($dY > 0$) and therefore private employment ($dL > 0$). Thus, demand management policies and indirect supply management policies increase private output. However, the effect of direct supply management policies on private employment and therefore private output is different. If we differentiate private employment with respect to public employment we get:

$$\frac{dL}{dL_g} = \frac{1}{z} \frac{dY}{dL_g} - 1$$

From the reduced form equation of output we can calculate the derivative of output with respect to public employment:

$$dY/dL_g = -zC_2(1-T_1)/A$$

substituting in the dL/dL_g relation we get:

$$\frac{dL}{dL_g} = \frac{C_2(1-T_1)}{A} - 1$$

Given that $A > C_2(1-T_1)$, then dL/dL_g is less than zero.

Thus, we have established that an increase in direct government intervention on the supply side (an increase in L_g) reduces private employment, which in the short-run implies a reduction in private output. Given that total output increases ($dY/dL_g > 0$), then we may conclude that the relative importance of private production is reduced. This might be one reason why an increase of state employment is so strongly opposed by the private sector.

So far we have assumed that government expenditures can increase without mentioning, where does the government get the revenue to finance its expenditures. Total government expenditures must be equal to government revenue plus government borrowing. Assuming that the latter is equal to zero, then the following equilibrium condition must always hold:

$$G = G_c + G_i + C_g + I_g + (w/P)L_g = tY$$

Thus, any increase in government expenditures should be financed by an increase in the tax-rate (t). In the literature of macroeconomic policy this is called the balanced budget multiplier. Another alternative is to increase government expenditures by as much as the change in income that this expenditure will generate. In general the following must hold:

$$dG = t dY + Y dt$$

All these have been well discussed in the macroeconomic literature and the model developed here can contribute nothing to this debate. However, what is important to note is that the theory of macroeconomic policy presented in this chapter does not advocate more or less government expenditures, but a better allocation of

government expenditures. This allocation will depend upon the structural parameters of the model, i.e., the shape of aggregate supply and aggregate demand curves. In other words, government expenditures can remain constant, dG is equal to zero, but what it changes is the proportion of government expenditures allocated to different policies. It is quite possible to decrease total government expenditures, but because of better allocation of government expenditures to have an increase in output. Thus, both objectives of a decrease in the budget deficit and an increase in economic growth are achieved. To demonstrate this important conclusion with an example let us assume that policy-makers decide to reduce direct demand management policies (C_g) by an amount equal to an increase in indirect supply management policies. In this case, total government expenditures do not change. What it happens is a re-structuring of government expenditures. Let us see what is the effect on output. A small change in C_g and G_s change output by:

$$\frac{dY}{dC_g} = \frac{zL_1(1-T_1)}{A} \quad \text{and} \quad \frac{dY}{dG_s} = -\frac{zL_2(1-T_1)C_2}{A}$$

As long as the two are not equal it is quite possible to increase the one type of government intervention financed by a decrease in the other. In the above example, if $-L_2C_2$ is greater than L_1 , then an increase in indirect supply management policies financed by a decrease in direct demand management policies increase output without any change in aggregate government expenditures. If L_1 is greater than $-L_2C_2$, then direct demand management policies should increase and the indirect supply management policies should decrease.

If we may repeat, our policy recommendations do not call for

higher government intervention (expenditures), it is already very large for most advanced countries, but our argument is for a restructuring of government expenditures. If this is taken into account, then it is quite possible to increase output or even to solve the problem of stagflation without increasing government expenditures or even better they may decrease. Thus, the debate should not be on higher or lower government intervention but on what type of government intervention. However, we should mention that reshuffling government expenditures is not an easy task because the institutions of policy-making may act as an impediment in applying new policies.

2. A Neoclassical Framework

In the previous section a model was presented that emphasized real wage rigidity and the link between supply and demand. In this section we present a more general theoretical framework that includes a monetary sector and a labor supply function. This approach enables us to analyze three types of models: the classical model, the equilibrium Keynesian model and the nominal wage rate rigidity model.

2.1 The General Model

A standard IS-LM, AS-AD model is presented with a complete specification of indirect and direct government intervention on both the supply and the demand side of the economy

Behavioural Relationships

$C = C(Y_d, G_c)$	Consumption Function
$I = I(r, G_i)$	Investment Function
$M_d = M(r, P, Y)$	Money Demand
$L = L(w, P, G_l)$	Labor Demand
$N = N(w, P, G_n)$	Labor Supply

Identities, Equilibrium Conditions and Technical Functions

$Q = Z(L+L_g)$	Production Function
$Y_d = (1-t)Y$	Disposable Income
$Y = C+I+C_g+I_g$	Aggregate Expenditures
$M_s = M$	Money Supply
$M_s = M_d = M$	Money Market Equilibrium
$N = L+L_g = E$	Level of Employment
$Y = Q$	Product Market Equilibrium

Following the approach of the previous section we can linearize the system of equation by taking the total differential:

- (1) $dC = C_1(1-t)dY + C_2dG_c$ $0 < C_1 < 1, \quad 0 < t < 1, \quad C_2 > 0$
- (2) $dI = I_1dr + I_2dG_i$ $I_1 < 0, \quad I_2 > 0$
- (3) $dY_d = (1-t)dY$
- (4) $dY = dC + dI + dC_g + dI_g$
- (5) $dM_d = M_1dr + M_2dP + M_3dY$ $M_1 < 0, \quad M_2 > 0, \quad M_3 > 0$
- (6) $dM_s = dM_d = dM$
- (7) $dL = L_1dw + L_2dP + L_3dG_l$ $L_1 < 0, \quad L_2 > 0, \quad L_3 > 0$
- (8) $dN = N_1dw + N_2dP + N_3dG_n$ $N_1 > 0, \quad N_2 < 0, \quad N_3 > 0$

$$(9) \quad dN = dL + dL_g = dE$$

$$(10) \quad dQ = z(dL + dL_g) = z dE \qquad z = dQ/dE$$

A brief discussion of the equations is in order here because they are very important for the conclusions reached later in this chapter. Real consumption expenditures is given by equation (1) and depends positively on real disposable income and real indirect government expenditures. Equation (2) gives real private investment which is negatively related to the interest rate and positively related to indirect demand management policies to affect real private investment. Equation (3) states that disposable income is equal to gross income minus taxes on income. Equation (4) sets total real income equal to real total private (C and I) and state (C_g and I_g) expenditures. The indirect government expenditures are not included because they already constitute part of private consumption and private investment.

Equations (5) and (6) give the nominal demand for money and the nominal supply of money respectively. The demand for money is equal to the supply of money. The latter is fixed by policy-makers. In the standard IS-LM model presented here we assume two assets: money and bonds. By Walras' law whenever the money market clears the bonds market clears, which is the reason why is not included. Actually, the assumption of two assets is too restrictive. The IS-LM model is consistent with many assets as long as we assume that all non-money assets are perfect substitutes for each other. A case with more than two assets has been analyzed by B. Friedman (1978). The nominal demand for money is negatively related to the interest rate, positively related to income and the price level.

Equations (7) and (8) model the demand for and the supply of labor respectively. If both functions are homogeneous of degree zero in prices and nominal wages, then an increase in prices or wages does not affect employment and therefore the supply of output. The demand for labor is negatively related to the nominal wage rate and positively related to the price level. Furthermore, the demand for labor is positively related to the indirect government expenditures on the supply side (G1).

The supply of labor is positively related to the nominal wage rate and negatively related to the price level. The labor supply is the most important relationship of the model because different assumptions on the values of the coefficients of the labor supply results to a different type of a model. If workers supply their labor in a perfectly competitive market with full information and certainty, then workers' supply is the solution to a utility maximization problem with income and leisure as choice variables. The result is a labor supply function which depends positively on real wage rate. In our model this would imply that the absolute value of N_2 is equal to N_1 . However, for a number of reasons discussed later, the labor supply may not be homogeneous of degree zero in money wages and prices. Finally, the supply of labor is positively related to indirect government intervention on the supply side that aim at affecting the supply of labor (Gn). Immigration policies is an appropriate example of such policies.

Equations (9) and (10) complete the supply side of the model. Equation (9) is the equilibrium condition of the labor market. Total employment is equal to private labor demand and state labor demand. The last equation sets the aggregate demand for output equal to the

aggregate supply of output. We proceed now to derive the aggregate demand and aggregate supply relationships.

Substituting (1) and (2) into (4) and solving for the differential of Y we get the IS function:

$$dY = \frac{I_1}{1-C_1(1-t)}dr + \frac{C_3}{1-C_1(1-t)}dG_c + \frac{I_2}{1-C_1(1-t)}dG_i + \frac{1}{1-C_1(1-t)}(dC_g + dI_g)$$

Equations (5) and (6) are used to derive the LM function:

$$dr = - (M_3/M_1)dY - (M_2/M_1)dP + (1/M_1)dM$$

From the IS-LM functions we can derive the Aggregate Demand:

$$\begin{aligned} dY = & - \frac{I_1 M_2}{M_1(1-C_1(1-t)) + I_1 M_3} dP + \frac{M_1 C_3}{M_1(1-C_1(1-t)) + I_1 M_3} dG_c + \\ & + \frac{M_1 I_2}{M_1(1-C_1(1-t)) + I_1 M_3} dG_i + \frac{M_1}{M_1(1-C_1(1-t)) + I_1 M_3} (dC_g + dI_g) + \\ & + \frac{I_1}{M_1(1-C_1(1-t)) + I_1 M_3} dM \end{aligned}$$

A few comments on the aggregate demand relationship are necessary. Aggregate demand is negatively related to the price level and positively related to indirect demand management policies (G_c and G_i), direct demand management policies (C_g and I_g) and money supply (M). The direct demand management policies differ from indirect demand management policies by the private sector's response to the indirect demand management policies. If this response is less than one (C_2 and/or I_2 are less than one), then the direct demand management policies have a larger effect on aggregate demand than the indirect demand management policies.

The aggregate supply is derived from equations (7) to (10). Equilibrium in the labor market requires that the nominal wage rate is equal to:

$$dw = (L2-N2)/(N1-L1)dP + L3/(N1-L1)dG1 - N3/(N1-L1)dGn + 1/(N1-L1)dLg$$

Equilibrium employment in the private sector is given by:

$$dL = (L2N1-L1N2)/(N1-L1)dP + L3N1/(N1-L1)dG1 - L1N3/(N1-L1)dGn + L1/(N1-L1)dLg$$

The differential of aggregate supply is given by substituting the above into the production function:

$$dQ = \frac{z(L2N1-L1N2)}{N1-L1}dP + \frac{zL3N1}{N1-L1}dG1 - \frac{zL1N3}{N1-L1}dGn + \frac{zN1}{N1-L1}dLg$$

The differential of aggregate supply depends on the differential of the price level, indirect supply management policies(G1 and Gn) and direct supply management policies(Lg). Setting aggregate supply equal to aggregate demand we solve for the equilibrium level of output:

$$\begin{aligned} dY = & \frac{M1C3z(L2N1-L1N2)}{B}dGc + \frac{M1I2z(L2N1-L1N2)}{B}dGi + \\ & + \frac{M1z(L2N1-L1N2)}{B}(dCg+dIg) + \frac{zI1(L2N1-L1N2)}{B}dM + \frac{I1M2zL3N1}{B}dG1 \\ & - \frac{I1M2zL1N3}{B}dGn + \frac{zI1M2N1}{B}dLg \end{aligned}$$

where $B = z(L2N1-L1N2)(M1(1-c1(1-\zeta))+I1M3)+I1M2(N1-L1) < 0$

The equilibrium level of the price differential is given by:

$$\begin{aligned}
dP = & - \frac{zL3N1(M1(1-L1(1-t))+I1M3)}{A} dG1 + \frac{zL1N3(M1(1-C1(1-t))+I1M3)}{A} dGn \\
& - \frac{zN1(M1(1-C1(1-t))+I1M3)}{A} dLg + \frac{M1C3(N1-L1)}{A} dGc + \frac{M1I2(N1-L1)}{A} dGi \\
& + \frac{M1(N1-L1)}{A} (dCg+dIg) + \frac{I1(N1-L1)}{A} dM
\end{aligned}$$

The equilibrium level of the differential output is positively related to all types of government interventions (direct and indirect, supply and demand). However, government intervention might be ineffective depending on the structural coefficients which are analyzed below.

On the other hand, the equilibrium differential of the price level is positively related to all demand management policies and negatively related to all supply management policies. Similarly to output, the extent of government intervention effectiveness on the price level depends on the values of the structural parameters.

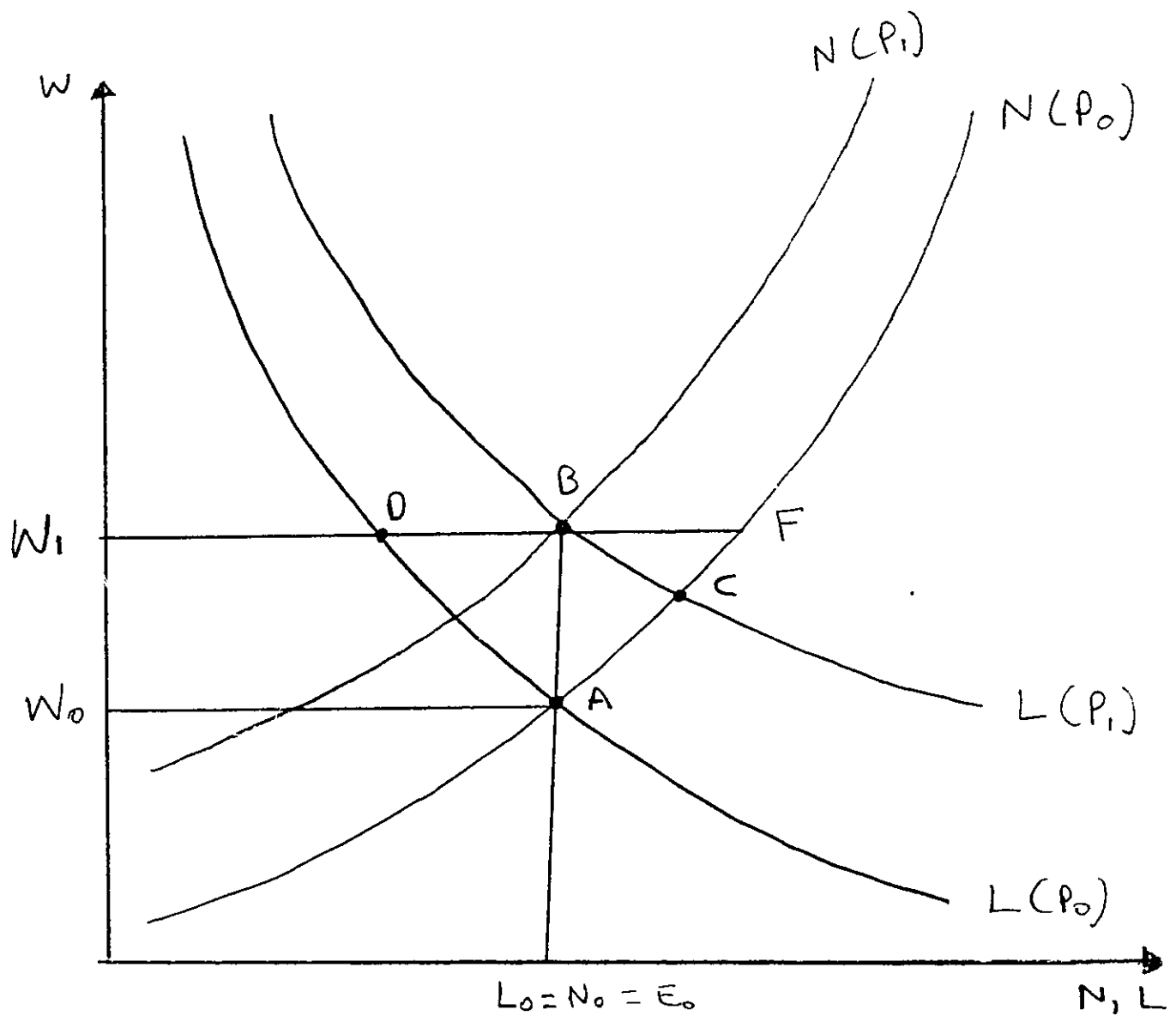
1.2 The Classical Paradigm

Two of the most important assumptions of the classical approach to macroeconomics is that both the demand for and the supply of labor depends on the real wage rate and that the labor market continuously clears. In other words, the price and the nominal wage rate coefficients are equal in absolute terms in both the demand for and the supply of labor and the real wage rate is the actual wage rate. Both functions become homogeneous of degree zero in prices and

nominal wages.

An increase in the price level shifts both the demand and the supply of labor in such a way so that total employment remains the same, but the nominal wage rate increases proportional to the increase in the price level. This is shown in figure 5.1. The initial equilibrium values of the nominal wage rate and employment are W_0 and E_0 respectively. Both curves are derived for a given price level $P=P_0$. Suppose that the price level increases. The demand for labor shifts to the right and the supply curve shifts to the left. If the demand and supply functions are homogeneous of degree zero in prices and the nominal wage, then the new equilibrium is reached at point B with the same level of employment but higher nominal wage rate. Notice that $W_0/P_0 = W_1/P_1$ implying that the real wage rate remained the same.

Figure 5.1 : The Effect of an Increase in Prices on the Labor Market



The reduced form for output and the price level within the context of the classical paradigm is easily derived by noticing that for homogeneous functions the following must hold:

$$L_2N_1 - L_1N_2 = 0$$

Then, it follows that dY and dP are equal to:

$$\begin{aligned} dY &= \frac{zL_3N_1}{(N_1-L_1)}dG_1 - \frac{zL_1N_3}{(N_1-L_1)}dG_n + \frac{zN_1}{(N_1-L_1)}dL_g \\ dP &= - \frac{zL_3N_1(M_1(1-L_1(1-t))+I_1M_3)}{I_1M_2(N_1-L_1)}dG_1 + \frac{zL_1N_3(M_1(1-C_1(1-t))+I_1M_3)}{I_1M_2(N_1-L_1)}dG_n \\ &\quad - \frac{zN_1(M_1(1-C_1(1-t))+I_1M_3)}{I_1M_2(N_1-L_1)}dL_g + \frac{M_1C_3}{I_1M_2}dG_c + \frac{M_1I_2}{I_1M_2}dG_i \\ &\quad + \frac{M_1}{I_1M_2}(dC_g+dI_g) + \frac{1}{M_2}dM \end{aligned}$$

A number of points are of interest here. First, demand management policies (direct or indirect) do not appear in the reduced form for output, which implies that in a classical model these type of policies have no real effect. Second, demand management policies and monetary policies have a positive effect on the price level. Thus, the argument made by the classical economists against demand management policies (Keynesian policies) is correct. According to the classical paradigm, these type of policies increase only the price level and have no real effect. Third, the classical argument against government intervention is incorrect because supply management policies do have real effect as well as affecting the price level. Fourth, the only way that supply management policies could not be effective is the case of zero marginal product of labor, which cannot be considered as an assumption that could be made by the classical school. Fifth, if labor supply is inelastic vis a vis the

nominal wage rate ($N_1=0$), then indirect supply management policies on the labor demand (G_1) have no real effect but indirect policies on the labor supply (G_n), i.e., immigration policies, do affect output. Sixth, demand and supply policies have an effect on the price level but in an opposite direction. An increase in the former increase the price level but an increase in the latter decrease the price level.

4.3 The Equilibrium Keynesian Model

The main opposition to the classical school, at least at the textbook level, is the Keynesian model. The contrasting assumptions Keynesians make on the labor market is that, whatever the reasons, the labor supply is not homogeneous of degree zero in prices and nominal wage rate. This results to an upward sloping aggregate supply function. What this implies is that the structural coefficients of the labor market must be such so that the following must always hold:

$$L_{2N1} - L_{1N2} > 0$$

The above is always true if the labor supply is only a function of the nominal wage rate, i.e., workers suffer complete money illusion ($N_2=0$).

An increase in the price level shifts the labor demand curve to the right but the labor supply either does not shift at all or it shifts to the left but by not as much as to reach point B in figure 5.1. The new equilibrium point will lie somewhere between B and C. This implies an increase in employment and therefore output.

Under the assumptions of the equilibrium Keynesian case demand management policies have a real effect but their effectiveness depends on the slope of aggregate supply. The less responsive to the price level is the labor supply, the flatter is the aggregate supply and therefore the more effective are the demand management policies. At the extreme, we have the classical case where aggregate supply is vertical and demand management policies (direct or indirect) have no real effect. On the other hand, demand management policies increase the price level which makes them an inappropriate policy for stagflation.

Supply management policies in a Keynesian equilibrium model have a real effect as long as the slope of aggregate supply is not perfectly elastic to the price level. In this case the labor supply is perfectly elastic at a given nominal wage rate (N_1 tends to infinity) or labor demand is very sensitive to price changes (L_2 tends to infinity). As we graphically analyzed in chapter four, in this type of macroeconomic world, supply management policies do not work but demand management policies have a relatively larger real effect.

Similarly, supply side policies in a Keynesian world affect the price level but only when aggregate supply is not perfectly elastic. Thus, it appears that when aggregate supply is horizontal supply management policies are not the right policies for stagflation because they affect neither output (employment) nor the price level (inflation).

1.4 Fixed Nominal Wage Rate Model

Another Keynesian approach is the so-called neo-Keynesian school. The microeconomic foundations of this school were developed in the mid-1970s by Azariadis(1975), Baily(1974) and Fischer(1977). A survey is given by Rosen(1985). The most important assumption they make is that the labor market is characterized by nominal wage rate rigidity. This can be the result of labor contracts as we have already seen in chapter one, which sets the nominal wage rate fixed for a given period of time. This time period is long enough to allow price fluctuations within the period. Here we are going to analyze the case where the nominal wage rate cannot decrease below a certain level. In terms of figure 5.1, the nominal wage is set equal to a value that exceeds the equilibrium value at point A ($W > W_0$) for a given price level. In this case, employment is determined by the demand for labor, while the labor supply with the nominal wage rate determines the unemployment rate.

In a neo-Keynesian world the labor supply plays no role in determining the level of employment because the latter is demand determined. However, given that the nominal wage rate is fixed for the time period, then the demand for labor depends only on the price level. An increase in the price level decreases the real wage rate because the nominal wage is fixed. The decrease in the real wage rate increases the demand for labor. Employment increases because the labor supply cannot respond to changes in the real wage rate. The reason is that the nominal wage rate is set by contracts. For any given nominal wage rate, unemployment is equal to:

$$U = N - L - L_g$$

Unemployment is equal to total labor supply minus private employment and state employment. Suppose that in Figure 5.1 the nominal wage rate is fixed at $W=W_1$ and that $L(P_1)$ is total demand for labor and $N(P_1)$ is total supply of labor. Total employment is given by point B. Now suppose that the price level decreases from P_1 to P_0 . The labor supply shifts to the right given by the new curve $N(P_0)$. On the other hand, the labor demand shifts to the left $L(P_1)$. Given that the nominal wage rate is fixed at a level that is above the market clearing wage rate (W_0), then the labor market is characterized by disequilibrium. The demand for labor determines the level of employment which is given by point D in figure 5.1. Involuntary unemployment is equal to DF in the sense that at the given nominal wage rate DF workers are willing to work but they cannot find a job.

As we said above, the demand for labor determines the level of employment because the nominal wage rate is fixed at level above the market clearing nominal wage rate. Thus, total employment (E) is equal to:

$$E = L + L_g$$

Now the differential of total employment is equal to:

$$dE = dL + dL_g$$

But we know that the total differential of private labor demand is equal to:

$$dL = L_1dw + L_2dP + L_3dG_1$$

Substituting dL into dE we get:

$$dE = L_1dw + L_2dP + L_3dG_1 + dL_g$$

However, we have assumed that the nominal wage rate is fixed for a given time period, i.e., the nominal wage rate is set by contracts,

so that:

$$dw = 0$$

Therefore, total employment is equal to:

$$dE = L_2 dP + L_3 dG_1 + dL_g$$

The differential of the supply function can be derived by substituting total employment into the production function:

$$dQ = z dE = z L_2 dP + z L_3 dG_1 + z dL_g$$

We should repeat here that the above is the differential of the supply of output as long as the nominal wage rate is fixed above the market clearing nominal wage rate, i.e., as long as involuntary unemployment exists.

If demand side is not affected by the disequilibrium in the labor market, then the demand equations remain the same as in section 3.1.(20) Thus, we can analyze the fixed nominal wage model in terms of its effects on the supply side of the macroeconomy. A number of observations can be made from the equation of the differential of aggregate supply. First, when we assume involuntary unemployment due to a fixed nominal wage rate, then the aggregate supply is flatter than the equilibrium Keynesian model. The slope of aggregate supply in a Keynesian equilibrium model is equal to:

$$dP/dQ = (N_1 - L_1) / z(L_2 N_1 - L_1 N_2)$$

On the other hand, the slope of aggregate supply in a fixed nominal wage rate model is equal to:

$$dP/dQ = 1/zL_2$$

(20) Actually, the demand side of the model depends on the supply side as we explained in section two of this chapter. In this context here, if we assume that the disequilibrium in the labor market affects the demand side of the economy, then we have the disequilibrium model, as this has been analyzed by Malinvaud(1977).

The above is less than the slope of aggregate supply in a Keynesian equilibrium model. Second, indirect supply management policies that aim at the labor supply have no effect on the supply of output and therefore this type of policy has no real effect. This is contrary to what we concluded for the classical model. In a classical world, government intervention on the labor supply had always a real effect as this was analyzed in section 3.2. Third, all demand management policies are more effective in a Keynesian framework with a fixed nominal wage rate than in a Keynesian equilibrium model. This is because the existence of involuntary unemployment results to a higher real effect and a smaller nominal effect, i.e., higher output effect and lower price effect. Fourth, direct government intervention on the supply side has a real effect as long as the aggregate supply has a positive slope. However, it is quite possible that private labor employment does not depend on the price level. A higher price level may not increase employment because firms cannot sell, i.e., Keynes' argument of effective demand. In this case, supply side policies are ineffective but government intervention on the demand side is very effective.

Conclusions

The distinction between direct and indirect government intervention has been shown to have a number of implications for the theory of macroeconomic policy. First, it was shown that the multiplier effect may not be the same for each type of government expenditures. The indirect expenditures multiplier may be less than the direct expenditures multiplier. The former depends upon

individuals' reactions to government expenditures. Second, supply side policies, direct or indirect are more effective in periods of stagflation while demand-side policies are more effective in periods of recession. Third, all types of government intervention increase private output with the only exception of direct government intervention on the supply-side. Direct supply management policies decrease the relative importance of private production.

Fourth, we argued that what is more important is not the level of government expenditures but the structure of these expenditures in terms of direct or indirect spending and supply or demand oriented spending. It might well be the case that the current structure and not the level of government expenditures is not the best for macroeconomic policy purposes as these are measured in terms of their effectiveness on unemployment, inflation and economic growth.

Fifth, the classification of economic policies presented in chapter three was analyzed in terms of four macroeconomic models: a fixed real wage rate model, a classical model, an equilibrium Keynesian model and nominal wage rate rigidity model. The basic conclusion common to all four models is that some types of policies under different assumptions may not be effective but in under the same assumptions government intervention may be effective (have a real effect) if some other policies are implemented.

APPENDIX

The Relationship between the Price Level, Real Profits and Private Labor Demand

An extensive microeconomic foundation of the model presented in the second section of this chapter is given in The Microeconomics of Capitalism, by John Broom. The main idea is the following. Production takes place with the use of labor power and means of production (tools, raw materials, land, etc.). However, in one good economy, consumption goods and means of production consist of the same aggregate commodity. Think of it as corn that can be used for consumption and production.

Capitalists organize production using as means of production the one aggregate commodity which was produced in previous period or periods. An increase in the current price leaves the real wage rate unchanged but it decreases the cost of the means of production used to produce current output:

$$Pr = Q - (w/p)L - MP/P$$

where

Pr : Real Profits

Q : Real Private Output

w : Nominal Wage Rate

P : Price Index

L : Private Labor Employment

MP : Nominal Value of Means of Production

or

$$Pr = Z(L) - kL - MP/P$$

For a given labor employment an increase in the current price level decreases profits by decreasing the real cost of the means of production. However, an increase in profits will increase labor demand because now more can be made per unit of labor power. Of course, it is assumed that firms price their output in a way that the value of the average product of labor is higher than the nominal wage rate, or:

$$P(Q/L) = jw \quad \text{where } j > 1$$

or

$$Q/L = j(w/P) = jk$$

or

$$Q = kjL$$

Given that profits are equal to :

$$Pr = Q - (w/P)L - MP/P$$

or

$$Pr = kjL - kL - MP/P$$

Solving for L we obtain:

$$L = 1/k(j-1)Pr + 1/k(j-1)MP/P$$

Differentiate L with respect to Pr we get:

$$dL/dPr = 1/k(j-1) > 0$$

Thus, an increase in profits increases private labor employment.

PART II : AN ECONOMETRIC MODEL FOR POLICY ANALYSIS

In this part we develop a small econometric model, which emphasizes the direct state economic activities in both the demand and the supply side of the economy. The state variables depend on two types of economic variables: policy and non-policy variables. The theoretical macroeconometric model is developed in the first three chapters of this part. Chapter nine summarizes the behavioural and technical relations of the model. In the same chapter we also add the identities and the equilibrium relations which complete the model. In chapter ten we give the estimation results using the Canadian experience of the first quarter of 1971 to the first quarter of 1987. The last chapter analyses the simulation results and it provides some policy experiments using alternative state economic activities.

We should notice that part II differs from part I in a number of ways. First, in part I a theoretical model was developed and therefore less equations and variables were used and more restrictive assumptions were applied, which is common when we analyze macroeconomics from a theoretical point of view. Second, in part II a monetary sector is included to complete the macroeconometric model. The monetary-financial sector was not included in part I. Third, the macroeconometric model of this part was developed as a prototype to show the role of direct government intervention. Our purpose was not to develop a detailed model neither for the private nor for the public sector.

C H A P T E R S I X

AGGREGATE DEMAND

Introduction

The analysis of the demand side of the economy has been well developed. This is true not only for macroeconomic theory but for macroeconometric models as well. The influence of Keynesian economics previously mentioned was the principal reason for this bias towards the demand side of the economy. In this section we present a standard aggregate demand model. We assume that the economy consists of two sectors, the private and the public sector. The aggregate demand includes a consumption function and an investment function for both sectors. It also includes the aggregate net demand for foreign goods, which is defined as imports minus exports of goods and services.

1. Private Consumption

The aggregate demand for current goods and services (the aggregate consumption function) by the private sector is one of the least controversial issues in macroeconomic theory. Since Keynes first presented his theory on consumption in 1936, a number of developments have resolved the controversies over the consumption function.(1) Private aggregate demand for current

(1) A survey of these developments is provided by Ferber(1973).

goods and services is a function of national income and total private wealth.(2) National income can be broken down in terms of wages and profits, the latter including interest payments. This distinction is very important for macroeconomic policy because it assumes that the marginal propensity to consume is greater out of wage-income than profit-income.(3) Demand management macroeconomic policies should take these differences into account because income distribution policies can boost aggregate demand for current goods and services.

Profits are defined as a residual from national income after subtracting total wages. This is an operational definition and does not imply that profits are determined in such a manner. The proportions of profits spent for current consumption is low whereas for wages it is high.(4) If national income is constant, an increase in profits would imply a decrease in total wages. The result will be a decrease in current consumption of goods and services. On the other hand, if national income increases, as is

(2) B. Friedman(1978) has defined wealth as the sum of capital stock, money, and government bonds. Barro(1974) argues that bonds should not be included as part of wealth because they are paid out of future taxes. In our empirical analysis we use the definition provided by B. Friedman on the basis of the same arguments provided by B. Friedman(1978, p. 610, fn 20).

(3) Kaldor(1956) made this argument explicitly in an income distribution model, which is the practice in many econometric models. Tinbergen's and Klein's models use this distinction as well. Kalecki(1944) has suggested that effective demand can be increased(decreased) by redistributing income from higher(lower) classes to lower(higher) classes.

(4) This is the conclusion of radical economic analysis. For example, Erdos(1982, p. 216) writes: "In the model of Capitalism....surplus value is composed of two parts: the personal consumption of capitalists(and of course of landlords) as well as of accumulation....The major part of surplus value is accumulation of fixed capital" Note that at the aggregate level surplus value is equal to the mass of profits.

the case in the real world, the proportion of income spent on current goods and services may decrease, if this income increase favours a distribution away from total wages. However, if total wages remain constant and profits increase, total consumption will increase but the average propensity to consume will decrease.

Total wages, on the other hand, have undoubtedly a positive effect on the level of consumption. Nevertheless, in the short-run, an increase in wages may not increase consumption in the same proportion. In the long-run when the short-run effects of the increase have been eased off, the additional wage-income is expected to be spent on current goods and services. In other words, the short-run marginal propensity to consume out of wage-income is low because workers may need time to adjust their lifestyle to higher consumption levels.(5) In the long-run the marginal propensity to consume out of wage-income will be higher. In this context, it will be interesting to see whether the classical assumption, which implies that all wage-income is spent on current goods and services, is valid or not. If it is valid, it would result in a long-run marginal propensity to consume out of wage-income close to one.(6)

(5) The argument of slow adjustment has been made by Brown(1952). Friedman's(1957) distinction between temporary and permanent increases or decreases in income is relevant as well. An increase in wages may be taken in the short-run as a temporary gain and thus may be saved. In the long-run, these gains, if they remain, become part of the usual(permanent) income, which is used to increase consumption.

(6) The classical economists, Smith, Ricardo, and Marx, all assumed that the wage rate is set equal to a historically determined subsistence level, which implies that all savings come from non-wage income.

Other economic and non-economic variables have been used in the theoretical and empirical analysis of the aggregate consumption function. Economic variables such as the interest rate and other prices have been used in the empirical estimates of the demand functions.(7) The rate of interest is not included here because interest payments by definition are part of profits. The latter is included as one of the determinants of private consumption. Human wealth may also be included but its effect can be explained by income since human wealth is highly correlated with it.

At the aggregate level, the argument that individuals are not free from money illusion or the fact that their expectations are not perfect makes the inflation rate a potential explanatory variable. Deaton(1977) included the inflation rate in the consumption function because consumers lack information on the movement of relative prices. Thus, when the price of an item that the particular consumer buys increases due to an increase in the overall price level, the individual might take it as a change in its relative price and thus decreases his consumption of it.(8) Even though this explanation can explain once-and-for-all increases in the price level, it cannot be used in cases of continuous inflation because consumers would learn that a particular price might increase due to a rise in the over-all price level. An alternative explanation can be given through the

(7) Wright(1967) and Weber(1970) provide an empirical support for the interest rate.

(8) A distinction should be made between anticipated and unanticipated inflation rate, but, as Koskela and Viren(1985) have demonstrated, both factors affect consumption with almost equal importance. Thus, if we use the current rate of inflation, we can capture both effects, i.e., the anticipated and the 'surprise' effects.

income effect, which is caused by inflation. An increase in the inflation rate redistributes real income from wage earners to profit earners.(9) Assuming that the marginal propensity to consume out of wage income is higher than out of profit income, this redistribution will decrease total private demand. Another explanation is given by Eckstein(1983, p. 21-22). He argued that an increase in inflation might 'accelerate spending', but consumers and business might decrease spending because of higher interest rates and an increase in uncertainty. Barsky(1986) argued that an increase in uncertainty reduces current consumption.

To sum up private consumption(CP) depends upon total wages(W), total profits(PRO), national wealth(V), and the inflation rate(PGR):

$$CP = C(W \quad PRO, V, PGR)$$

+ + + -

The sign under each variable shows the direction (positive or negative) of the effect of the explanatory variables on the dependent variable.

We should note here that in chapter three we argued that indirect demand management policies can be used to affect total aggregate demand through its effect on private demand. Policymaking of this type requires that the above structure of the consumption function is known. Then, government policy includes the use of policy instruments such as taxes, money supply,

(9) We make the assumption that wages cannot keep up with the inflation, which by the way was not the case in most countries in the 1970s.

interest rate, etc., to affect the level of wages, profits, inflation and wealth, which are the determinants of private consumption.

2. Government Consumption

Government consumption or expenditures on current goods and services should be separated from private consumption.(11) State consumption depends on two types of economic variables: those that describe the state of the economy and those which reflect the level of development of the economy. The state-of-the-economy variables are related to policy-makers' concerns. It is this aspect of state consumption which is of interest as a direct demand management policy. The concern on the macroeconomic performance of the economy is very important because it reflects the fact that the government has a 'policy reaction function' to the macroeconomic situation.(12) Thus its expenditures should respond to economic indicators chosen by the government as its priorities.(13) (14)

(11) The first model, which used this distinction between private and government consumption, was formulated by the Soviet economist Fel'dman in 1930's. His model has been neglected and only Domar(1957) praised its merits. Later all econometric models have used this distinction of aggregate expenditures.

(12) By a 'policy reaction function' is meant that governments actively respond to prevent and cure economic problems using whatever instrument they have at their disposal. Thus, government activities are or should be conditional on the state of the economy, i.e., boom, recession, depression and stagflation.

(13) The inclusion of a policy reaction function into macroeconometric models has been evaluated favorably by Mosley and Cracknell(1984)

(14) Controversies over the state of the economy are not as serious as the ones over the appropriate indicators. Conservative

However, this response is not free from constraints. Government expenditures cannot fluctuate above or below a certain limit which is set by the level of expenditures of previous periods. Brown(1952) has made a similar argument, but one related to private aggregate expenditures. He assumed that individuals are changing their consumption pattern very slowly. This argument was made to justify the inclusion of lagged private expenditures into aggregate consumption, which can apply to state expenditures as well. The modern power structure of society is such that all interest groups may influence government policy decisions.(15) Thus, dramatic changes in government expenditures may instigate tremendous social pressures which undermine the credibility of the government itself. This implies that once a certain level of government consumption has been reached, it is very difficult to have dramatic decreases or increases no matter what the state of the economy is. This argument is more appropriate for a short period of time. This sluggish response or persistence of government consumption justifies the use of the previous period's consumption level.

Government consumption can be used as a substitute for private aggregate consumption and this has been the Keynesian prescription

governments might use the inflation rate while Liberals the unemployment rate or a combination of both but with different emphasis. The interest rate may also be used as an indicator. In B.M. Friedman's(1975) terminology these variables are called intermediate targets.

(15) The development of the new field in the literature of public economics of public choice has emphasized the role of interest-groups. An appraisal and an empirical verification is given by Mueller and Murell(1985). The persistent government growth, which is the main argument of Wagner's law, has been analyzed by many studies: see the essay by Vatter and Walker(1986).

in the event of a relatively weak aggregate demand. This can create an economic crisis which is demand-initiated. Government can and has prevented this type of economic crisis by acting directly on the source of the problem. It can increase government expenditures in order to compensate the decrease in private consumption. If private demand is below its long-run trend, then the government can respond by increasing its spending on current final goods and services.(15) If it is above this trend, then government expenditures should decrease relative to their own level. In this way government expenditures are used to stabilize national aggregate demand. This is the substance of direct demand management policies. Thus, if government expenditures are used to stabilize the total aggregate demand, they should be negatively related to the relative level of private aggregate demand, relative to total aggregate demand. The higher the private demand, the less becomes the need for substitution with government consumption.

Government consumption has also been used as an indirect instrument for supply-managed policies, even though this type of policy can be second best in its efficiency and effectiveness as was explained in chapter four. However, its wide use by policy-makers makes government expenditures dependent on supply-side considerations and this has to be taken into account in empirical

(15) What the government does with this excess supply that buys is irrelevant. It can simply destroy it or store it for future consumption. The problem government faces in this case is similar to the one faced by the marketing boards, i.e., they have to determine the long-run value of the demand they face so they can stabilize the short-run by storing or selling.

research.(16) If the private sector is unable to utilize fully resources including capital and labor, then the government can increase its aggregate demand and thus anticipate an increase in capital and labor utilization.(17) This differs from the previous case in the sense that government expenditures respond to an economic crisis initiated by the supply-side while the aggregate private demand has not changed with respect to its recent trend. The capacity utilization rate and/or the unemployment rate can be used to explain this type of government consumption behaviour.

Government expenditures are restricted by government revenue. Taxes cannot be raised continuously and thus act as a constraint on expanded government spending. In order to take into account this constraint, the public deficit is included as a determining factor of the public sector's expenditures on current goods and services. The public deficit has been the concern of many governments in the advanced capitalist countries. Austerity measures to limit public spending have been the policy objective of many governments in the last few years. It is important here to distinguish between government expenditures, as they appear in national income statistics, and government consumption, which is used in this work. The public deficit is defined as the statistical definition of government expenditures, which include wages and salaries as well as transfer payments, minus total

(16) This is more true for the 1970s and 1980s when it appears that the world economies were experiencing supply shocks and the policy-makers responded with the 'good' old policies of demand management.

(17) This is similar to the concept of actual and potential output. Kuh(1966) discusses some of the problems associated with the measurement of potential output.

government revenue raised through taxes and other means. In this context, by definition an increase in statistical government expenditures will increase the deficit, if revenue remains constant. However, we define government consumption similarly to the concept of private consumption. It includes only those government expenditures which are spent on final goods and services. Now, an increase in the deficit, for whatever reason, may initiate a government action to decrease government consumption.

As in the case of private consumption, the inflation rate is expected to play a role but one which has an opposite effect. State consumption cannot be affected by the inflation rate in the same way that private expenditures are affected. An increase in the inflation rate may increase government expenditures for two reasons: firstly, state consumption has a very low price elasticity of demand, at least in the short run. A low elasticity makes the price effect (an increase in the inflation rate) very small. Thus, as prices go up, the quantity of goods demanded by the government may go down, but total expenditures increase.

The theory of bureaucracy can be used to explain the low price elasticity of government expenditures. The reason is that bureaucrats spend public money, without encountering the same constraints as private individuals and thus they respond differently to price changes. In addition, government departments are interested in providing specific programs. An increase in the cost of these programs will usually increase the money allocated to these specific programs. Bureaucrats maximize the budget of their department because this increases their prestige and

consolidates their position. Then, an inflationary period is a good opportunity for them to overstate the real erosion of their budget by arguing that the prices they face increased more than the national average. The result will be a real increase in the funds allocated for their department. Another and more important explanation is that the types of goods government buys, such as military goods, have low demand price elasticity.

Secondly, a higher inflation rate in the overall economy affects adversely the lower income classes, who are wage earners. There are a number of reasons to explain why inflation might be a burden for the low income classes. First, money illusion decreases the real wage rate. Second, even in the absence of money illusion, low income people have very little power to resist the erosion of their real wage rate. Third, even if we assume that workers are unionized and therefore they have the power to impose their demands, the fact that wages are set by contracts implies that an increase in inflation decreases real wages. An empirical verification of who gains and who losses from inflation is given by Minarik(1978). The erosion of the real wage due to inflation increases the number of people that join the ranks of those that are below the poverty line. In a welfare society this would increase both direct and indirect government expenditures.(18) Even though both effects are important, the first one is expected to be the dominant reason, which explains the positive relation

(18) It is only the direct government expenditures which constitute a part of government consumption that is of importance in this context. Such expenditures will include the provision of free or low housing to the poor, health care, welfare services, counselling services. Indirect government expenditures are transfers of income through the welfare provisions.

between the inflation rate and government consumption. This results from the definition of government consumption used here. Expenditures on welfare are mostly transfers of income, which are not included in our definition of government consumption.

The unemployment rate (low capital utilization) and government deficit as determinants of state consumption are related to policy-makers' concerns. It is this part of state consumption that is used as a direct demand management policy. But as we stated above, a great portion of government expenditures does not depend on economic policy concerns only or on economic variables in general.(19) For example, the level of national income and its rate of growth have necessitated an expansion of government expenditures. Thus, they should explain some of the changes in the aggregate public consumption. As income rises and society becomes wealthier, more income can be commanded by the government. As in the case of private consumption, the level of development of the economy can be used to explain the increase in government spending. Both the development level and national income explain that part of government expenditures which can be considered independent of the short-run state of the economy.

The government consumption(CS) then depends on the level of income(Y), the unemployment rate(UR), the level of private aggregate demand(CP), the inflation rate(PGR), and the government

(19) Wagner(1883) and Peacock-Wiseman(1961) argue that government expenditures depend upon the level of society's development. The latter study has suggested non-economic effects such as the two World Wars, which overshoot government expenditures, which never returned to their previous peace-time level. This is the so-called 'displacement effect'.

deficit(D):

$$CS = CS(Y, UR, CP, PGR, D)$$

+ + - + -

Unemployment, inflation, private level of consumption, and the deficit are all indicators of the performance of the economy and affect the decisions of policy-makers in setting the level of state consumption. It is these variables to which policy-makers respond with a direct demand management policy, such as state consumption.

3. Private Investment

Unlike consumption, investment is an unsettled issue in economic literature. The classical and neoclassical argument which proposes that investment depends on the interest rate, i.e., the opportunity cost to invest, has not performed very well in empirical tests.(20) Instead, other variables such as output, capital utilization ratios, profits, availability of finance, and replacement requirements have been used to explain the investment behaviour of the private sector.(21) The findings have not been encouraging and the aggregate investment of the private sector

(20) Even on theoretical grounds, Sandmo(1970) has shown that the interest rate fails to explain investment in the long-run using a neoclassical model.

(21) See Jorgenson(1971) for a survey on the determinants of investment function. Meyer and Kuh(1957) tested a number of potential explanatory variables. Their conclusion was that the effect of some variables was conditional on the state of the economy, i.e., recovery, recession, and boom periods.

remains a controversial issue.(22)

After all, Keynes might have been right when he relied on 'animal spirits' to explain investment, a variable which hardly can be quantified or even described. However, private investment does depend on profits, particularly expected profits, which is the ultimate goal of any capitalist(investor).(23) Profit maximization as a behavioural assumption of capitalist production has more adherents than detractors.(24) The argument in support of profit maximization is straightforward. Capitalists use money to buy capital and labor to produce goods and services in order to sell them at a value higher than the original amount of money used in the production process. If the end result is not profit, then there is no apparent reason to invest the money in the first place. The amount of capital to employ would depend upon the amount of profit expected. Any change in the capital stock is by definition investment. Thus, the amount of investment depends upon the expected level of profit. If profits have not performed well in econometric studies, then the definition used for profits is inappropriate to explain the relation of profit and investment. Actually, it has been argued that national income statistics are inappropriate to calculate the rate of profit.(25)

(22) See Abel and Blanchard(1986).

(23) Profits include interest payments. For a similar argument and the problems of calculating the profit rate, see Amsdem(1981).

(24) Alternative theories are those of sales maximization, satisficing and entry prevention. No matter how persuasive these theories are and how much empirical support they command, I think they fail on logical grounds. For example, how can one explain the goal of entry prevention or sales maximization or satisficing without associating it with profits at least in the long run? Alternative theories of the firm are surveyed by Machlup(1967).

(25) This point has been made explicitly by Asimakopulos(1984).

We have argued in the previous section that a great portion of profits is used for capital accumulation, that is investment, and a very low proportion for consumption. If this is valid, then the profit coefficient in the investment function is restricted to being not only positive and between zero and one but also to have a value very close to one at least in the long-term period. The reason is very simple. If all profits are invested, then the marginal propensity to invest out of profits should not be statistically different from one.

Another variable which is claimed to affect the level of investment is the stock of capital already existing in the economy. The higher the capital stock, the less investment is required. Thus, there is a negative relation between the stock of capital and the level of investment. An increasing amount of capital expansion in the production process needs an increasing amount of profit to maintain the same amount of return on the invested capital. We can use the ratio of fixed capital to total capital(Q) used in the production process to show the effect of capital accumulation on the level of new investment.(26)

Demand-side considerations should be taken into account as well. If demand fails to absorb total supply, an underutilization of existing capital is the short-run effect. As demand increases, new investment is not expected to increase until a normal level of utilization of the existing capital occurs. Thus, the capacity utilization rate should be another explanatory variable in the

(26) The definition of total capital used here is different from conventional approaches. Total capital is the sum of wage fund and fixed capital. It is the money spent in the production process.

demand for capital goods. However, it is expected that the demand effects should be reflected by the profit levels. A sluggish aggregate demand will decrease profits and thus will decrease investment.

Another important element of the investment function is its cyclical behaviour from period to period. Periods of high build-up of capital goods are followed by periods of decreasing investment. Thus, investment from previous periods affects current investment. This effect can be explained by including lags in the investment function.

Thus, our private investment function will depend upon the mass or the rate of profit(PRO) and the relative capital intensity ratio(Q):

$$IP = I(PRO, Q)$$

+ -

The higher the rate of profit or the mass of profits, the higher will be the investment which is explained by the positive sign under the correspondent variable. On the other hand, the higher the capital intensity of production, the lower will be the amount of investment.

4. Government Investment

Public investment has a long history of being the most important state economic activity. Investment in infrastructure has been the concern of ancient as well as modern states. There

are many reasons that can explain public investment but the profit motive is not included on this list. Contrary to the private sector's investment behaviour, the public sector does not invest to maximize profits. This is true for public enterprises as well.(27)

As in the case with government consumption, government investment also depends upon two types of variables. Firstly, there are the variables which are independent of the policy concerns. Secondly, we have the variables that describe the state of the economy and affect the variability of state investment at least in the short-run. In the former group belong such economic variables as the stock of public capital, the society's development level, and the level of income. The latter group can include the unemployment rate, the capacity utilization rate, and the level of private investment.(28)(29)

One of the fundamental state economic activities has been the build-up of social capital or infrastructure. Ancient states, such as the Chinese, Persian, and the Egyptian, are known for making huge investment in social capital which included public utilities (water supply), dams, roads, and public buildings. Thus, public

(27) The objectives of public enterprises are numerous but profit maximization is not in the list of the main objectives. These objectives are discussed by Mitnick(1980) and Baumol(1980)

(28) The two types of variables are not independent from each other and can be defined as such only in a short period of time. Policy-makers do care about the level of development as we have discussed in the third chapter.

(29) Policy-makers respond to these variables as the deviation of the trend level from the actual level increases. Thus, depending on the phase of the business cycle, policy-makers may use the government investment to minimize the deviation of the actual value from the trend value.

investment is positively related to the need to build up social capital. Variations in this type of need are not easily quantifiable. It depends on both economic and non-economic factors. The wealth of society is the most important economic factor but may not be sufficient. Non-economic factors, such as the personality and the aspirations of government (rulers), might be more important than the level of development in explaining the level of public investment.

The level of development makes the building of a country's infrastructure and prestige more affordable and thus affects positively public investment. On the other hand, how advanced the country is or how rapidly it grows affects public investment for other reasons as well. As the development process speeds up, the need for social goods such as roads, parks, and bridges increases. Goods that were once considered luxuries are now within the budget of the national economy.

Wealth, which indicates the level of development of a particular country, is an important determinant of state investment. As wealth increases, more can be spent on public goods. This creates a pressure on government to supply these goods, which in turn increases the investment in state industries. Wealth is a non-policy determinant of public investment, even though it is related to the state of the economy. The relation between wealth and state investment as a macroeconomic policy is negative. If the economy is growing (wealth increases), then the government needs not to intervene, which implies that it restricts state investment. Thus, wealth can have a positive or a negative effect on state investment.

We expect that the positive effect will usually dominate for two reasons. First, as wealth increases, the need for public goods is more acute than the need to stabilize the overall national investment. Second, even if government attempts to substitute private investment for public investment, which would imply a negative relation between private and public investment, the relation between wealth and state investment can still be positive because the latter can be used to increase wealth independently of the level of private investment. In many advanced capitalist countries, state investment is well planned to serve the long-run economic development of the country. This can only be demonstrated by empirical research, which can verify whether private investment is significant as an explanatory variable, which would imply a negative relation with public investment. A positive relation would be implied if public investment accommodates private investment.

The unemployment rate can also be included in the equation of state investment. An increase in the number of people without jobs increases the pressure on government to provide alternative employment opportunities through public projects. This positive relation between unemployment and state investment is questionable because government policies towards unemployment have been demand-side or indirect supply-side policies instead of direct-supply management policies. The influence of Keynesian economics affects the type of policies to be applied to cure unemployment, even though they are not considered first best. However, this issue can be only resolved empirically.

The equation of state investment(IS) is expected to depend on the level of private investment(IP), national wealth(V), and the unemployment rate(UR):

$$IS = IS(IP, V, UR)$$

? + +

The question mark indicate the fact that the effect of private investment on state investment cannot be determined on theoretical grounds.

In the above specification, we abstract from the lagged dependent variable but it should be included, as was the case for private investment. State investment is a dynamic relation and it takes time for its full effect to be applied. There are three stages in the process of public investment that make it a dynamic relation. The first stage is to identify the need for public investment. Second, there is the decision stage, which might involve a lot of time and include such activities as lobbying by particular interest groups, the decision of the senior bureaucrats, the decision of government, and the approval of Parliament. The third stage is the funding and implementation of the project. All these stages take time, which justifies the use of lagged variables in the state investment function. Another explanation is that investment-in-progress has an effect that goes beyond one period.

5. Net Foreign Demand

There are very few countries in the world that can claim economic independence. These countries that are open to international trade face an additional constraint in their macropolicy design, which comes from the balance of trade. The balance of trade is the net aggregate demand for domestic goods and services by foreign residents. The increasing importance of foreign trade, along with the instability of the international monetary arrangements, has created the need for an international institution to play the same role that governments play at the national level. The institutional change from fixed to flexible exchange rate has changed the role that policy-makers can play for exchange rate management.

National governments, however, can affect the net demand for domestic commodities by changing the relative prices of domestic goods, which is possible by changing only one price, i.e., the price of the national currency. Direct measures can be envisaged but they have not been proven effective. Government can reduce its demand for foreign goods by purchasing from domestic production, but this is not always possible if domestic production is not sufficient or, even worse, nonexistent. Governments can substitute imports with domestic production but it might result to inefficient allocation of resources. Indirect measures, such as export subsidies, can also affect the net foreign demand.

The net demand for domestic goods and services is equal to total demand for domestic goods minus the demand for foreign goods

by domestic residents. To explain the net demand, we have to explain its two components: exports and imports.

Exports depend upon the level of income of the countries that trade with the national economy. An increase in foreign income is expected to increase total foreign demand for domestic goods. Another important factor is the prices of domestic goods. The law of the negative sloping demand function is even more applicable at the international level. Very few countries can charge a higher price for their exports without experiencing a falling demand, which might be so strong as to decrease the overall revenue. In other words, the price elasticity should be larger for traded than non-traded commodities.

Imports depend positively on domestic income and negatively on the prices of imports. In both exports and imports, the exchange rate should play an important role because it affects all the prices of goods that are imported and exported. The effect of the exchange rate on the net foreign demand can either be positive or negative. The whole literature on devaluation has stressed the fact that devaluation may not improve, as is expected, the balance of trade.(30)

A distinction between short and long-run is important in analyzing the effects of devaluation on the balance of trade. In the short-run, devaluation might deteriorate the balance of trade because imports have already been ordered and are being paid in foreign exchange while exports respond with lag to the lower

(30) For a survey of the theories of current account models, see Krueger(1983, ch. 3 and 4).

price. In the long run, however, the price effect (exchange rate) will induce higher exports and lower imports. Both result to an improvement in the balance of trade. Thus, devaluation results in a J-type effect by first decreasing the balance of trade and, then, increasing it.

Exports(E) will depend on the foreign output(YF), the price of exports(PE), and the exchange rate(ER):

$$E = E(YF, PE, ER)$$

+ - +

Imports(IM) will depend on domestic income(Y), the price of imports(PIM), and the exchange rate(ER):

$$IM = IM(Y, PIM, ER)$$

+ - -

Both the price of exports and imports are expressed in terms of domestic units. The exchange rate is the value of one unit of the foreign currency in terms of units of the domestic currency.

Conclusions

The distinction between direct and indirect government economic activities have been the main consideration in modelling the demand side of the macroeconomy. In this chapter, an attempt was made to contribute to the specification of state consumption and state investment. Both state economic variables depend on two types of variables. The most important of them for our purpose here(policy analysis) are the economic variables, which describe the short-run state of the economy, which is what policy-makers

operate upon. The other variables describe non-policy concerns in the short-run and therefore are not of concern here.

CHAPTER SEVEN

AGGREGATE SUPPLY

'I expect to see the state ... taking an ever greater responsibility for directly organizing investment' (J.M. Keynes)(1)

Introduction

The tradition in macroeconomic policy is to model explicitly and extensively the aggregate demand side, including government demand. The aggregate supply side has received less attention even though in the last few years economic literature is flooded with so-called supply-side economics. As a direct result of the Keynesian influence, the earlier models of Tinbergen(1952) and Klein-Goldberger(1955) were demand models.(2) Supply did not play an important role in determining the level of output. It was shown in chapter three that this is true only under certain conditions. Later models have included an explicit specification of the supply side. In most cases this has been the result of applying neoclassical microeconomics to macroeconomics, i.e., an aggregate production function, a derived demand for the labor function (which is the solution to a profit maximization problem) and finally, a labor supply function derived from a substitution of leisure and work, or wage formation assumptions. Less

(1) Keynes(1936, p. 164)

(2) As the opening quotation states, Keynes' view was more for direct supply policies. The Klein-Goldberger(1955) model had a supply side(production function) but this was to determine the level of employment. The level of output was demand-determined. Tinbergen(1952) had no supply side at all. However, his 1939 model had what he called a 'supply or price equations' for goods and services; see Bodkin, et. al. (manuscript, ch. 2).

aggregated models use supply and demand functions and technical relations which differ for each sector of the economy or between various industries. However, I know of no model that makes the distinction between private and state aggregate supply. This distinction is the fundamental contribution of this chapter in the practice of macromodels, in general, and modelling the government sector, in particular. This distinction is very important not only for finding solutions to current economic problems, but also for explaining better the economic fluctuations in the period after the Second World War.(3)

There are many reasons which can explain the asymmetric treatment of supply side relative to demand side. Apart from the influence of Keynesian economics, which was very important, there are other reasons as well that are related to the nature of the supply side compared to the demand side. Direct supply management macropolicies may undermine the existence of the capitalist system itself, i.e., the private production of goods and services and their exchange for profits. Keynesian(demand-management) policies do not impede private production; on the contrary, they promote it. It is more lucrative for the private sector to have the government as its buyer.(4) Thus, an increasing government role in the demand side of the economy is not sufficient to abolish or to constrain the private mode of production. At the limit, government can consume(purchase) all the national product, but still the

(3) This period is marked by systematic government intervention in both the demand and the supply side of the economy.

(4) Hunt and Sherman(1981) discuss the role of government purchases in pp. 529-539. Sweezy(1942, 1970) was the first to stress the importance of 'waste' and government purchases from the private sector (pp. 308-311 and 343).

production of goods and services could be completely owned and controlled by the private sector.

Direct supply management policies, i.e., public production of goods and services, do not have the same effect on the private mode of production. If it is true that an increase in direct supply management policies is imperative for capitalism's existence, then a modern contradiction arises.(5) When public production expands, private production may be curtailed.(6) We assumed, however, that an increase in public production was dictated by the needs of private production. Thus, what makes private production sustainable in the short-run (higher public production) may destroy it in the long-run. If the substitution of public production for private production continues, then it is a matter of time until we see the disappearance of the private mode of production. However, there are limits as to how far government production can expand and it is doubtful that it can substitute for private production completely.(7) In any case this does not

(5) The "old" contradiction is that between the need for capital accumulation and the rate of profit. Capital accumulation requires high profits but more capital accumulation decreases profits. The rate of profit is defined as the product of the rate of surplus value and one minus the organic composition of capital. An increase in capital accumulation increases the organic composition of capital and decreases the rate of profit. Needless to say that this has been a controversial issue not only on how to measure the rate of profit but on its tendency to fall over long-run periods; see Robinson(1942), Christiansen(1976), Hunt(1983), Blaug(1980, pp. 1-31), Loranger(1984), Nordhaus(1974), and Feldstein and Summers(1977).

(6) Note that this is not necessarily true. If we have a rapidly growing economy, both private and public production can grow at the same time but the relative share of private production is decreasing.

(7) These limits can be economic, political, ideological, or social.

make public production less important.(8)

In this chapter we develop the equations for private and state labor demand, the supply of labor, the technical relations(production functions) of both private and public output, and finally the pricing relations for private and state product. The pricing functions are included in the supply section because supply-side factors are taken to be more important than demand in determining the level of prices for both sectors.

1. Private Labor Demand

The labor market is undoubtedly the most important market in an advanced capitalist economy. Many theories have been advanced to explain the function of the labor market and the factors that influence its 'equilibrium'.(9) Theories have been developed to explain the demand for labor, the supply of labor, and through their interaction, the 'optimal' wage rate, and the optimal labor employed. In a capitalist economy, the demand for labor comes from both the public and the private sector. The factors that influence the decision of how much labor to employ might not be the same for each sector. Actually, we postulate that they are not the same and for macropolicy purposes that they should not be the same.

(8) It is important to note that government produces an output, which is distributed free of charge but it is paid for through general taxation. This has been called the socialization of private goods provision(Usher 1977). Government determines the price, the quantity, and the quality of the type of goods produced. However, not all public goods are provided this way, e.g. electricity, or water supply.

(9) Killingsworth (1983) gives a survey of these theories.

The theories advanced to explain the private demand for labor can be distinguished between market-clearing and non-market-clearing theories. In the first case (market-clearing), the wage rate is the most important factor in determining the level of labor demanded.(10) The theory advanced by the New Classical school in macroeconomics makes the clearing assumption of the labor market one of their core postulates. Monetarists accept the clearing assumption of the labor market, but they are more careful since they assume that not all unemployment is natural, at least in the short-run. Market imperfections may create a divergence in the short-run between the market-clearing quantity of labor and the actual level of employment.(11)

Other factors have been advocated as determinants of private labor demand besides the wage rate, such as the profit level (past and expected), the state of aggregate demand side, the possibility of realizing profits, and the trade unions.(12) Thus, the wage rate is not the only factor responsible for clearing the labor market, even though a lower wage rate might help bring equilibrium in the presence of high unemployment. A continuous decrease in the wage rate is not necessarily going to guarantee more employment if profits are not high enough, or if the realization of profits is not possible. The whole literature in general disequilibrium

(10) This is true for the short-run. In the long-run the wage rate will not be the only determinant of labor demand. The level of capital stock and technology plays an important role as well. Technology and capital stock are taken as fixed in the short-run.

(11) M. Friedman in his 1968 article was careful to define the Natural Rate of Unemployment in a way that is consistent with various levels of unemployment. However, he does allow for short-run disequilibrium in the labour market.

(12) Parsley(1980) discussed the role of trade unions and their effect on the wage rate.

relies primarily on the effects of a non-clearing market on another market.(13) For example, if the goods market does not clear, then even if the wage rate decreases, unemployment might not decrease. Thus, the alleged high wage rate was not the reason for the high level of unemployment. This is not to imply that a high wage rate does not affect the employment decisions of the private sector, but that other factors might play a dominant role. Thus, unemployment may persist even without 'sticky' wages.(14)

Profits affect the private demand for labor positively. Higher profits imply higher capital accumulation and thus higher investment, which means higher future employment (higher private demand for labor). Over time, a higher mass of profits facilitate the increase in employment, the decrease in unemployment, even with higher wages. In other words, what matters is not the absolute level of wages, but their relative value, relative to the level of profits. Thus, we might have the apparent paradox of wage rates moving procyclically, that is employment and wage rate increases are positively correlated.(15) Then, when a negative relation between employment and wages is to be derived, the mass of profits or their expected changes should be held constant.(16) The realization of profits, which depend on the state of the

(13) Contributions by Clower(1965), Patinkin(1965), and the synthesis and extension by Barro and Grossman(1971) are the most important contributions to this literature.

(14) Sticky wages can be explained by the realistic assumption of wage contracts. Azariadis(1975) and Fischer(1977) have used wage contracts as their basic assumption to explain 'sticky' wages.

(15) This is one of the conclusions of the general disequilibrium analysis '...disequilibrium analysis of the labor markets suggests that real wages may move procyclically' Barro and Grossman(1971, p. 332), in Korliras and Thorn(1979). This conclusion was empirically confirmed earlier by Bodkin(1969).

(16) An increase in expected profits will shift the Phillips curve

aggregate demand, should also be held constant. As a matter of fact, disequilibrium analysis emphasizes the effect of profit realization (the goods market does not clear) on the labor market (kinked demand for labor) and as a result the labor market does not clear.(17)

The structure of aggregate demand is also a factor that should be taken into account in determining the demand for labor. First, a distinction should be made between those countries that are relatively open economies and those that are relatively closed. In the first case, total aggregate demand should be divided into domestic demand and foreign demand. An increase in foreign demand (an increase in exports) increases the demand for domestically produced goods, which in turn increases the private demand for labor. For some open economies, such as the Canadian economy, the employment effect of exports is of important magnitude.

Due to Keynesian influence, the state demand for current and future goods and services has been used as indirect employment policy. The argument is that aggregate demand is not large enough to bring 'equilibrium' in the labor market. The gap between the private demand and the effective demand can be partly filled by an increase in government expenditures. This has been the basic policy prescription to the employment problem. Thus, we should expect a negative relation between government expenditures and the private demand for labor. A higher private demand for labor will

to the right, which would imply that at a given level of unemployment a higher wage rate can be paid.
(17) The original contribution of Patinkin(1956, 1965) examined the role of excess supply of commodities(nonrealization of profits) on the labor market.

require less government expenditures.

Another important aspect of the private demand for labor is its relation to the level of unemployment. The New Classical School and Monetarists have argued that the private demand for labor is sufficient to accommodate all the workers willing to work at the given wage rate. However, the natural rate of unemployment as defined by M. Friedman(1968) is flexible and adjustable with any level of unemployment.(18) Radicals, on the other hand, have been arguing that the existence of unemployment is the result of the private labor demand. This is the so-called reserve army of the unemployed argument. It is this surplus labor which disciplines workers in their demand for higher wage rates. Keynes was very careful on this point and very sceptical about policies which attempt to decrease the unemployment rate even below ten percent.(19) A lower unemployment rate will increase the pressure for higher wages, which undermine the private mode of production. On the other hand, J. Robinson(1979) has advocated that this argument may not hold anymore because of trade unions, which are able to force higher wages even at high levels of unemployment. This is very critical for a macropolicy design, which intends to increase private demand for labor as a means to lower

(18) Friedman argues that 'the natural rate of unemployment is the level that would be ground out by the Walrasian system of general equilibrium equations, provided there is imbedded in them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the cost of mobility, and so on.' All these reasons can be used to justify any capitalist level of unemployment as a natural level.

(19) This point is discussed by Hutchison(1977) and in Keynes' 1937 article.

unemployment. If Joan Robinson is correct, then we might end up with higher wages in the short run and loss of jobs in the long run. This is because the higher demand for labor is absorbed through the ability of workers to raise their wages. In the long run, firms do not replace retired workers with new workers but substitute capital for labor instead.(20) However, there is doubt that trade unions are capable of setting the wage level at their own discretion, as we shall see in the labor supply section of this chapter.

The private demand for labor(LDP) then depends on the private wage rate(WRP), profits(PRO), the foreign demand for domestic goods(E), and the state aggregate demand(SC+SI):

$$LDP = LDP(WRP, PRO, E, SC+SI)$$

- + + -

2. State Labor Demand

Our basic assumption throughout this work has been that state economic activities do not aim at maximizing profits. Instead, their purpose is to facilitate the normal operation of the private sector. This is not to imply that their main purpose is only to ensure the maximum profits possible for the owners of capital, but also, at the same time, they have the gigantic task to ensure that the values of the capitalist system such as private ownership of

(20) In the short-run firms can substitute capital for labor, if trade unions cannot guarantee job security.

the means of production are not undermined.(21) In other words, the state's role is to ensure profit maximization for the capitalists, but at the same time not to undermine social stability. Depending upon the nature of the problem, there are many ways the state can ensure social stability. For example, if unemployment is the problem, then public employment can be one solution. Thus, what appears to be against the private mode of production is actually a policy to ensure social stability, because higher levels of unemployment could undermine the acceptability of the system. Then, the level of unemployment should explain part of state labor demand. However, the response of state demand for labor to the level of unemployment may not be the same and depends very much upon the beliefs of policy decision-makers regarding the allowable level of unemployment.

The growth of public employment cannot simply be explained by the inability of the private sector to absorb excess supplies of labor power. The increasing demand for publicly produced goods and services have increased the government's demand for labor.(22) Wagner's law states that higher levels of income increase the demand for goods and services produced by the state. Thus, the level of income is another determinant of the state's demand for labor. As society's income rises, the demand for publicly

(21) The twofold character of the state's social purposes is the main reason why writers such as Poulantzas(1969, 1973) and Miliband(1969) refer to the relative autonomy of the state from social classes. They simply confuse the appearance for the underlying causes. The state favours the needs of the system as a whole, i.e., private ownership of the means of production, not an individual capitalist.

(22) The government production of goods and services depend on policy variables, such as unemployment but on non-policy variables as well such as the level of wealth of a given society.

produced goods and services increases, which in turn increase the demand for labor.

The distinction between public and private goods is not a clear cut one. All goods and services can be provided by either sector.(23) Hence, the increasing role of public employment is not explained simply by a higher income. The increasing role of state production, and thus public employment, should be associated with the inability or unwillingness of the private sector to undertake or provide all the economic functions(services) of a modern capitalist society. Public sector production did not simply take over bankrupt or abandoned sectors of the economy but expanded into areas where the private sector was unable to contribute. Thus, the state attempted to fill the gaps in the private sector, thereby sustaining its operation. A good example is nationalization. There are many arguments concerning nationalized firms, but one argument that has been underestimated is the fact that the state, in most cases, nationalizes industries that are going to fail. Why doesn't the state buy profitable industries? This would be the case if the state really wanted to replace private production with public production.(24) Nationalization occurs because the state's 'duty' is to guarantee the general economic functioning of the capitalist system.(25) The appropriate

(23) It is common belief that services such as judicial should be provided by the state because the private sector is unable to 'produce' them. However, the private sector can provide these services and make profits out of these. In the United States there has been a private provision of judicial services; see Koepp(1986)

(24) In some LDCs nationalization has occurred for profit(revenue) reasons, particularly the resource industries but in our work we are concerned with the advanced capitalist countries.

(25) The theory of general equilibrium asserts that, when (n-1) markets clear, then the nth market by Walras' law will clear. For

variable that might explain this type of state action is the rate of profit.

As was the case with the private demand for labor, the state demand for labor also depends upon the wage rate. The state wage rate has been a controversial issue and is far from being determined by supply and demand alone. In almost all the advanced capitalist countries, public employees are well organized in trade unions, and it is argued they are able to increase the wage rate whenever possible. The downward inflexibility of the state wage rate, then should be more acute than the private wage rate. The wage fund is a big part of government expenditures and is the one that is very difficult to reduce, at least in the short run. As a matter of fact, the wages and employment in the public sector can be positively related. A higher demand for workers in the public sector can be the reason for higher wage settlements. This is the result of the monopoly-monopsony elements in both the supply and the demand side of the state labor market.(26)

The private wage rate may affect the state labor demand in two ways, directly and indirectly. First, the relative level of private wage rate(relative to the state of the economy) can be used as an indication of the 'tightness' of the private labor

our purposes here we can reverse the argument and say that if the nth market doesn't clear, then the (n-1) markets will have problems reaching a stable equilibrium. Then, the state's role is to make sure that not only all markets clear but at the same time the important markets are functioning.

(26) Freeman(1986, p. 61) has argued that 'In the private sector it is commonly accepted...that one of the responses to union wage effects is a reduction of employment...this is questionable for the public sector because lobbying for higher budgets could raise employment as well as wages.'

market. If the private wage rate is relatively high, then the state might not increase its labor demand to decrease unemployment because they hold the high wage rate responsible for the high levels of unemployment in the private sector. On the other hand, a high wage rate might imply a shortage of labor. In this case, policy-makers can decrease state employment in order to decrease the tightness in the labor market. Second, the private wage rate may affect negatively the state demand for labor through an expected increase in the demand for higher state wages. This is consistent with the argument that public employees set their wage demands according to the private wage rate settlements. Another argument that leads to the same result is that the state is willing to offer wages similar to the private sector's for two reasons. First, they want to preserve an equality between the two sectors and, second, they don't want to attract low quality workers. In both cases they have to match the private sector's offers.

To summarize, the state labor demand(LDS) depends upon the level of output(Y), the unemployment rate(UR), the level of profit(PRO), the state wage rate(WRS), and finally the private wage rate(WRP):

$$LDS = LDS(UR, Y, WRS, PRO, WRP)$$

+ + ? - -

The effect of state wage rate cannot be determined on theoretical grounds. It can be negative or positive depending on the bargaining process and power of the state and trade unions.

3. Labor Supply

The important distinction we have made throughout this analysis between public and private is not applicable to labor supply. In other words, in the model the supply of labor is not divided between supply of labor to the state and to the private sector. The reason is that individuals who supply labor are indifferent to working in the private or the public sector, as long as they have the same characteristics such as wages, job security, fringe benefit and opportunities for promotion. The alleged desire of many workers to become public employees in many advanced countries can be explained by differences in these characteristics, including the wage rate, offered by both sectors. Other distinctions in the labor supply can be drawn: skilled and unskilled labor, agricultural, industrial, and service sector labor, male and female. However, the above distinctions are not adopted here because we want to keep the analysis as aggregative (simple) as possible. Nevertheless, many of the conclusions we derive are not affected by this aggregate approach to labor supply.

The received view on the theory of labor supply presents it in a choice-theoretic framework. Workers choose between work and leisure in an intertemporal world. This type of analysis presupposes a competitive labor market where all the participants have the same power to affect the equilibrium wage and employment level. In this world unemployment does not exist and, if people are unemployed, then this is their free choice to take 'vacations'. The theory appears logical but has little

relevance.(27) Critics attacked the realistic properties of the theory. A number of writers have criticized both the assumptions and the conclusions of the theory.(28) They stress the uncertainty of the labor market and its institutional aspects, such as the existence of trade unions. They conclude that employment and wages are set by contracts, which determine the wage rate outside the free play of the short-run market forces. This theory is more realistic but it has some limitations. First, it assumes that unions and employers have the same power in determining the wage rate. Second, the role of the state is virtually ignored. The state affects the supply of labor in a number of ways: (a) population policies, (b) immigration policies,(29) (c) the state can affect the cost of being unemployed and thus the tendency of people not to accept lower wages, which includes monetary policies(inflation decreases the real wage), welfare policies such as unemployment insurance, income support plans, pension plans, employment subsidies, and day-care services.

Trade unions and professional associations can directly affect the supply of labor for a specific profession by screening their members or preventing employers from hiring non-union members. The purpose of these actions is to ensure higher wages but evidence

(27) The New Classical and Monetarist approaches adopt this type of analysis of the labor market as we explained in the first chapter.

(28) Azariadis(1975), Bailey(1974), Fischer(1977) and Gray(1976), are some of the contributors who criticize this approach.

(29) One might argue that population and immigration policies are the same thing but they are not. Immigration policies are more effective in two ways. First, they increase the supply of labor immediately, and second they can increase the supply of that type of labor which is most needed. In this context the analysis by Ward(1975) is relevant.

suggests that the wage differential between unionized and non-unionized sectors is not due to unions but to other factors such as productivity differentials, and the ability of the firm to pay higher wages to attract better quality workers.(30) Actually, the causality may run the other way around '...wages affect unionization to a greater degree than unionism influences wages'.(31) However, the wage rate does affect the supply of labor. Higher wages may induce workers to work longer or housewives to enter the labor market. At the same time, wages below subsistence level may also induce workers to work longer and there is nothing paradoxical about this type of reaction, but we expect the over-all effect to be positive, i.e., as wages go up, more labor is supplied. However, it is quite possible that at high wage rates the substitution effect between leisure and income may overcome the income effect, which will result to a backward-bending supply curve.

As mentioned above, population and immigration policies have been used extensively by the state. These, however, do not exhaust government policies. There are many ways in which governments can affect the labor supply. It is important to understand the nature of labor supply in order to be able to explain these alternative policies. What is important at any given period of time and place is not the size of the labor force which exists in an economy, but how much is in excess of demand.(32) The state attempts to maintain a certain level of excess supply of

(30) See Atkinson(1983) pp. 133-137.

(31) Parsley(1980) p.29

(32) This is the definition of excess supply of labor.

labor which is 'socially' tolerable. Government policies aim at this segment of labor supply. First, they can affect the real wage rate through general taxation (both direct and indirect), minimum wage legislation, etc. An increase in minimum wage or a decrease in wage income taxes, or a decrease in the taxation of products labor buys will increase the supply of labor. Second, government policies can affect the labor surplus through public employment programs or high public wages. However, the latter policies may increase the labor supply, particularly that type of labor which has difficulty finding jobs in the private sector at their reservation wage, i.e., educated young people, housewives, and certain minorities.

In brief, the labor supply(LS) depends on the private and public wage rate(WRP and WRS), population growth(POP), and the ratio of unionized to non-unionized workers(TUR):

$$LS = LS(WRP, WRS, POP, TUR)$$

+ + + -

4. Technical Relations

Labor and capital are the necessary inputs to produce goods and services.(33) The amount of labor and capital needed to produce a given amount of output is determined by the technological

(33) They are not sufficient though. Nature is another input as well. Marx(1875, p. 11) made this distinction clear by stating that labor and capital (past labor according to Marx) are not the source of all wealth but nature is a source as well.

advancement of the society. For example, 'in that early and rude state of society' without capital accumulation, the dexterity of labor is the only determining factor in producing use values.(34) In this case, we can say that output is simply a function of labor. In modern societies capital plays an important role. The so-called production function(set) gives the maximum(level of) output that can be produced from a given combination of labor and capital.

The production function is an important part of any economic model. A number of important relations can be shown using the production function. The most common production function in use was the Cobb-Douglas, which was originally developed to explain the share (distribution) of income between labor and capital. Thus, production functions can be used to show the share of different inputs, but they are not sufficient to explain fully the rewards received by different factors of production. The marginal productivity theory of distribution has been challenged on many grounds, but the most important one is its unrealistic properties.(35)

The production function becomes an important tool in explaining economic growth (growth in the factors of production) and development(technical change). A production function can be used to show the returns to scale of any industry or firm, the substitution between capital and labor at different wage-rental

(34) See Adam Smith(1776, p. 150).

(35) Frank(1984) has found that workers are not paid according to their marginal product in a number of industries.

ratios, and the efficient allocation of resources.(36) The most important properties of production functions for our purpose is the efficiency factor, the substitution among different factors of production, and the choice of technique.

The choice of technique, that is, what method of production to use, has been a very fundamental issue in economic development literature. Neoclassical economics asserts that the choice of technique is determined solely by the production set and the wage-rental ratio. In other words, it is a strictly mechanical problem. All the firms have to do is to calculate and equate the marginal rate of substitution between capital and labor to the wage-rental ratio, which is given by the market.(37) This view abstracts completely from the relations of production that exist in a particular country at any point in time. The choice of technique depends very much upon the relations between capital owners, labor, and the state. At any given wage-rental ratio, the need to control and dominate labor by capital in the production process determines the extent to which labor is used. The choice of technique is very critical in the debate between public versus private production.

In the model presented here, we use two technical relations, one for private sector production and another for public production. There are many reasons that justify the use of different production functions. First, we can show using

(36) A discussion of these issues is given by Desai(1976) pp. 106-107.

(37) This is the reason why the role of entrepreneurs or firms is not important in the neoclassical model. See Binks and Coyne(1983, ch. 1)

different production functions which type of production is more efficient, a very controversial issue between those that support public production versus private production.(38) Second, this separation will enable us to analyze the macroeconomic implications of public production. If public production is used to increase employment, then the capital-labor ratio should be lower in the state production function. This is in relative terms because public production by its very nature could be more capital-intensive. An alternative way is to see whether the choice of technique in the public sector is more labor-intensive, which can be explained by the elasticity of factor substitution. Thus, the elasticity of substitution of labor for capital in the public sector should be lower than in the private sector.

Thirdly, the distinction between private and public production will show whether or not public production contributes to economic growth and development, which was considered in chapter three as one of the most important goals of macroeconomic policy. This is an issue that can be settled on empirical grounds and becomes a very important one when it is viewed against the experience of advanced capitalist countries in the post Second World War period. This period has been marked by unprecedented levels of economic growth and government intervention.

(38) The differences in efficiency might not be comparable because the public and private sector produce different types of output. However, there are industries in which private and public firms co-exist. In these cases, the efficiency of private and public firms may be compared assuming of course that they have the same objectives. The evidence is far from conclusive in favour of private firms. Caves and Christensen(1980) have shown that in the case of Canadian railroads the public firms were not inferior to private firms. Also, Baumol, ed.,(1980) has shown no conclusive evidence in favour of the private enterprises.

Thus, the distinction between private and public output necessitates the use of two production functions in our economic model. Both outputs(private and public) are functions of capital and labor. Hence, private output(YP) depends on the private capital stock(KP) and the private labor employment(LDP):

$$Y_P = Y_P(K_P, L_{DP})$$

State output(YS) is a function of state capital(KS) and state labor employment(LDS):

$$Y_S = Y_S(K_S, L_{DS})$$

In macroeconomic empirical research a problem arises in the measurement of state capital and state output. We deal with these problems in chapter ten.

5. Price Functions

Price instability is costly, which is a view shared by most macroeconomists and was explained in chapter three. The rate of change of the price level(inflation rate) creates instability in many markets by affecting expectations about the real rate of returns and by encouraging speculative activities in all markets. It redistributes income between wage-earners and profit-earners. This view of costly price instability is not shared by some microeconomic analysts. Waugh(1944), Oi(1961), and Massell(1969) have shown that price instability due to both demand and supply

shocks is preferred to price stabilization.(40) However, the microeconomic approach is different because it is concerned mainly with the price instability of one commodity or with changes in the relative price but we can extend their argument to include one aggregate commodity. Even if we aggregate, the analysis does not become appropriate to what macroeconomists consider as the most important factor, namely money illusion. In microeconomic analysis, money illusion is not taken into account because all the demand functions are assumed homogeneous of degree zero in income and all prices.

The pricing of output becomes very important at the macroeconomic level. Severe price instability can destroy any economy and, as a result, stabilization becomes out of control. The experience of the German hyperinflation and the current hyperinflations of Latin American countries have eroded national currencies and the economic progress of these countries.

In many advanced capitalist countries inflation was the major concern in the 1970's and the early 1980's. The important question relates to price determination. Neoclassical economics assumes perfect competition and therefore relative prices are equated to marginal cost. In addition, they consider the discussion on absolute prices as irrelevant since they are set by the money supply. Instead, neoclassical economics is concerned about changes in relative price levels. For a number of reasons this

(40) This view has been criticized by Samuelson(1972) and Kooten and Schmitz(1985). The latter study found positive welfare gains from price stabilization in the Canadian Broiler Industry. At the macroeconomic level Long and Summers(1986) have shown that price flexibility may be destabilizing.

approach is considered inadequate for our purpose here. The marginal cost approach has strong theoretical support in a situation of perfect competition. In other cases the model is not sufficient to explain price setting. Marginal cost pricing is irrelevant. The real world seems to be better represented by mark-up pricing. This approach claims that firms set the price equal to unit-cost of production(average cost) plus a profit margin(mark-up).(41)

Another shortcoming of the Neoclassical theory, which is important in this type of analysis we pursue here, is its irrelevance to the pricing of public output. Public output is not priced in order to maximize profits. It should be set in such a way as to meet a number of economic objectives, the most important one being price stability. The mark-up pricing approach can be applied to the pricing of state output because at the limit we can assume the mark-up of public output is zero or even negative. Negative mark-up pricing may occur when public goods are priced below average cost.

Mark-up pricing equations assume that the price level is proportional to the unit cost, which includes both labor and capital. The cost of capital can be left out, if the price function is for the short-run. The cost of imported inputs can also be included in the pricing function. This type of specification leaves out the demand side, which in the short-run can affect prices even though the unit cost may not change. Thus,

(41) The theoretical underpinnings for the use of mark-up pricing are discussed by Nordhaus(1971). See also Malinvaud(1977 p. 10) and the econometric evaluation by Eckstein and Fromm(1968).

we include a measure of excess demand which can be approximated by per capita consumption.(42)

Private prices(PP) are then a function of the wage rate(WRP), per capita consumption(YP/POP), and the cost of imported inputs(CII):

$$PP = P(WRP, YP/POP, CII)$$

+ + +

Another important variable that might play role in the determination of private prices is productivity. An increase in the productivity of labor should decrease private prices, assuming that higher productivity is not absorbed by higher wage-rates.

Prices in the public sector should be a function of macroeconomic magnitudes. The inflation rate can be affected directly by the pricing of public production. If government wants to affect prices, it can reduce the rate of growth in the price of its own output. However, reducing prices is not free of constraints, which renders uncertain the effect of the over-all inflation on state prices. Government has to cover a certain proportion of its cost; otherwise it will be driven into bankruptcy. Budget deficits fueled by the deficits of public enterprises cannot continue forever without undermining the economic stability of the system. Government cannot borrow unlimited amounts from either domestic or foreign residents. Thus,

(42) Another potential index of aggregate demand can be the normalized difference between actual and potential output proposed by Aschheim and Tavlas(1984, p.22)

prices in the public sector(PS) are determined not only by the unit cost of production(WRS) but by the over-all inflation rate(PGR), which is nevertheless constrained by the public deficit(D).

$$PS = PS (PGR, WRS, D)$$

$$? \quad + \quad +$$

The over-all price level is proportional to the public price level and to the private price level. The importance of each, however, is different and it is expected that the private price level has greater weight than the public one. The value of private output is higher than the value of public output. The prices of public goods and services change very slowly and usually are fixed for a certain period of time, i.e., one fiscal year. However, the two proportions should add up to one and the weight of private output is expected to be greater than one half.

As was the case with state capital and state output, state prices can not be calculated because most of state output is not traded. In our empirical research we used an index of state prices, which has been calculated by Bank of Canada.

Conclusions

Macroeconometric models have inadequately incorporated the government sector. This was more true for the supply side than the demand side of the economy. The basic contribution of this

chapter is that fully incorporates the government sector into the supply side of the macroeconomy. The distinction between private and state economic activities is fundamental when we separate the demand for labor, the supply of output, and the aggregate price level into their private and public components. This distinction will enhance our understanding of government economic activities for economic policy purposes.

CHAPTER EIGHT

MONETARY SECTOR

Introduction

Unlike the highly theoretical model in chapter five, we now explicitly include a monetary sector to complete the econometric model. However, what is important to notice is that in this chapter we diverge from the mainstream approach to both the demand and the supply of money. The most important differences are that (i) the private sector is explicitly modelled not only in the demand for money relation but in the supply of money as well and (ii) we relate the demand for money to the process of capital accumulation and therefore the rate of profit.

The level of a country's economic development is directly related to how advanced are its monetary and financial sectors. The advanced capitalist countries are the most monetized economies in the world. The monetary sector and its by-product, the financial sector, has become one of the most important 'industries', in any advanced national economy.(1) It completely dominates the service sector in terms of both 'output' produced and employment created. The monetary sector has a strategic role to play. The money market has become one of the most crucial markets.(2)

(1) The monetary sector includes all the institutions and activities which deal with the supply of and the demand for money such as public and private banks, and other financial institutions.

(2) Conventional economic theory assumes implicitly that all markets are of equal importance. This is a harmless assumption if and only if all markets clear, which is not the case in reality.

Early radical writers had stressed the importance of the monetary sector, when it was still at the threshold of its development in the late 19th century.(3) The major economic crisis in the 1930's, primarily a financial crisis, demonstrated the importance of the monetary sector and, at the same time, confirmed that radical economists were correct in focusing their attention on this aspect of the capitalist economy.(4)

But what makes the monetary sector so important? It is important in an economy where all transactions are monetized. Thus, the role of money -the 'output' of the monetary sector- and the extent to which it is used in the production and exchange processes should be the main thrust of an answer to the above question. The role of money has been increasing since its invention.(5) The level of development of the productive forces has conditioned the use of money in all aspects of economic life. The need to exchange has become one of the most important pre-conditions for the existence of money. Money has played the role of medium of exchange, which today is still one of its most important functions. Transactions can take place without money but if money were not used in the modern capitalist economies, the amount of transactions they carry out could not have been

(3) The most important studies in this context are those by Hilferding in 1910 and Lenin in 1916.

(4) Paul Sweezy(1942), an economist trained in the conservative tradition, has argued that only radical economists have provided a systematic explanation of that crisis. It is not surprising that many scholars during the thirties turned to radical economic analysis for an answer. As a matter of fact radical economic analysis was not only able to offer an explanation of the crisis but had predicted it as well.

(5) Galbraith(1975) gives an excellent and amusing history of money and the financial sector and the big crises it created.

possible. In other words, the existence of money initiates and facilitates a number of transactions that otherwise could not have occurred.

The role of money as a means of exchange does explain the importance of the monetary sector in an advanced capitalist economy. It is my contention that the importance of the monetary sector lies in the relation between money and the need for capital accumulation in the capitalist economy.(6) The circulation of money has facilitated the accumulation of huge amounts of capital through financial intermediaries, a fact which has drastically changed the entire process of the accumulation and investment of an economy's social surplus. In a non-monetized economy, this surplus cannot be accumulated and invested as easily, because it has different forms and its use is extremely inflexible.(7) However, in a completely monetized economy, if each individual's small share of surplus is collected together, it becomes a substantial amount of money. This is what has been occurring in the recent history of capitalism. Money does not only facilitate exchange but creates, i.e., it is a means, for capital accumulation.(8) Thus, the role of money is not only in

(6) Radical economists have explained well the accumulation process in a capitalist economy but they have underestimated the role of money in this process. S. de Brunhoff(1976 and 1978 ch. 2) has attempted to fill this gap.

(7) In a non-monetized economy the form of economic surplus is physical output left over for next period's production. This is not the case for a monetized economy where surplus takes the form of money.

(8) It might appear that this role of money is related to its other function as a store of value. The role of money as a store of value is the result of its function as a means of exchange. Money as a means for capital accumulation is a different function and relates to the transformation of surplus into productive activity.

the circulation process but in the production process as well.

Money has become the means for modern capital accumulation. Thus, the significance of a modern monetary sector is its role in the capital accumulation process. The link between capital accumulation and the monetary sector is what makes the latter a strategic sector of any capitalist economy since it affects every aspect of any production process taking place under the private mode of production. This link can also explain the severity of the so-called financial crises. In this chapter we analyze the role of the monetary sector by looking at the supply of money, the demand for money, and the over-all monetary equilibrium.

1. State Money Supply

The money supply is a monopoly of the government. This does not reflect the inability of the private sector to create a medium of exchange (the most important role that money plays), but shows the importance of money in the economy.(9) There are many economic reasons that justify the government's monopoly in supplying money, such as the competitive production of money will make the price level either indeterminate or infinite, money production is a natural monopoly, or money is a public good.(10)

State money supply depends upon two types of economic

(9) Money can be supplied privately as we explain in the following section.

(10) Vaubel(1984) provides a list and discuss some of the economic reasons for government's monopoly of money supply.

variables. First, it depends on variables that are related to economic policy. This is because money supply can be used as an instrument of economic policy to implement either an indirect demand or supply management policy. Policy variables include the inflation rate, the unemployment rate, the budget deficit and the level of output growth. Second, state money supply depends on other economic variables which describe the level of development of a particular economy, such as the level of income and wealth. We proceed to discuss both types of variables in some detail.

The simple textbook view on money supply is similar to their assumption on any government activity. It is assumed that money supply is exogenously determined. Money supply is not exogenous but responds to a number of pressures. These pressures could be direct, i.e., an excess demand for goods and services creates a need to hold money for transaction purposes, or indirect through the government budget deficit. Deficits are created because governments are asked to supply goods and services, or to subsidize a certain economic activity while, simultaneously, there is resistance to higher taxes, which forces governments to print more money.

Printing money as one way to finance government expenditures is not a new phenomenon; its history is as long as the history of printed money. However, what comes first is not the printing of more money but the creation of a 'need' to increase government expenditures with the least resistance possible. An increase in taxation can serve the same purpose, but there is a political and economic cost associated with this type of financing of government expenditures. Another advantage of money as a source of revenue is

the time needed to raise the revenue. In the case of taxes, it takes time to collect the funds to finance a specific project, but printing money can create all the revenue required the same day that the decision is taken.

The need to print more money to finance additional government expenditures can be approximated by the level of the budget deficit. This presupposes that the other side of the deficit, i.e., government revenues and borrowing, remain the same. A decrease in money supply will increase the budget deficit. The relation is negative because financing additional government expenditures by printing more money decreases the real value of the deficit.

The second economic variable which affects state money supply and is of interest to policy-makers is the inflation rate. As a matter of fact, in the recent practice of policy-makers, state money supply has been the primary or exclusive instrument used to fight inflation. The debate in monetary theory is between those that argue inflation is the result of an excess money supply and those who argue inflation is the cause for an increasing money supply. The latter view states that money supply passively responds to an increasing inflation rate.(11) A higher inflation rate has to be accommodated by a higher money supply to service the same amount of transactions. For policy reasons there must be a negative relation between the inflation rate and the rate of growth of money supply. But the other two reasons make this

(11) Kaldor(1983) provides a discussion of this argument. Wells(1983) provided an empirical support of this view. An opposite result has been found by Whitney(1982).

relation undoubtedly positive. The difference is the direction of causality.

We argued above that increasing public expenditures may increase money supply to finance them. Kaldor(1983, p. 65) has forcefully argued that it is the private sector's borrowing requirements in situations of crises (bankruptcies, low rate of profits) and not the public sector's borrowing requirements which puts pressure on banks to supply more loans, which in turn puts pressure on the monetary authorities to accommodate their needs for extra cash. In other words, the supply side of the economy may have an effect on the growth of state money supply. It can be used as an instrument for indirect supply management policies. It will then depend on the unemployment rate or the capital utilization rate. The higher the unemployment rate, the higher the need for more money supply. Thus, there is a positive relation between the unemployment rate and the state money supply.

Another economic variable of interest to policy-makers can be the growth of output. However, the level of output may be a cause for higher money supply due to higher need for transactions. Thus, the level of output determines a level of money, which is not under the control of policy-makers. Another variable of this type is the level of development, which can be approximated by the level of wealth. An increase in wealth is expected to increase the supply of money. Thus, the relation is positive.

State money supply(MSS) depends on policy and non-policy variables. The first will include the budget deficit(D), the inflation rate(PGR), and the unemployment rate(UR). The variables

which are not under the control of policy-makers, at least in the short-run, are the level of output(Y) and the level of wealth(V):

$$MSS = M(D, PGR, UR, Y, V)$$

$$- \quad ? \quad + \quad + \quad +$$

2. Private Money Supply

In recent years, it has been argued that the monetary sector has undergone a structural change which has been facilitated with the technological advances and the changing role of the financial institutions.(12) All these have made the multiplication of monetary base much easier and faster than before. This has resulted in more transactions being carried out by the same amount of money. The characteristic of this transformation is a 'faceless' money. More and more transactions are taking place without the use of currency supplied by the government. The wide use of credit cards is the most striking result of this transformation, but the real change is the ease with which credit is created by the financial institutions.

Financial institutions, undoubtedly with the help of the computer technology, are able to match payments with payrolls in such a way that money is not needed for an increasing number of transactions. The old argument for the use of money was the different time that expenditures and income take place. Banks with

(12) One type of change has been the wide use of credit cards; see Akhard and Milbourne(1984).

the use of computer technology can match expenditures and income without the use of any intermediary such as money. Banks and other financial institutions can directly pay a number of bills and receive payrolls. This increases the number of transactions with a given amount of base money. This substitution of money has taken place in the recent period through the creation of so-called 'electronic' money.

We have seen in the previous section that the money base is the monopoly of the government. The coins and notes in circulation (monetary base) is totally controlled by the government through its central bank. On the other hand, the 'new' money creation discussed above is separated from the monetary base because it is not directly controlled by the government, but is indirectly regulated. This new type of money supply is created and controlled by the financial institutions but not only by them. Credit cards can be issued by any large store but their importance is very limited because their acceptability (an important characteristic of all credit cards) does not extend beyond the store itself. However, credit cards issued by the financial institutions have wide acceptability, which can extend even beyond any national boundary.

An important question is what gave rise to this new form of money supply by the private sector. This private money supply is undoubtedly the result of the new computer technology, but at the same time the result of an increasing government control of the monetary base since the big financial crisis of the 1930's. Governments, using monetary policy, attempted to control and stabilize aggregate demand according to what they perceived was

necessary. An easy money supply policy was implied by a weak aggregate demand, while a tight money supply was forced by inflationary pressures assumed to be the result of overspending. Needless to say, this type of policy affected directly private aggregate demand and, thus, the realization of profits.

It was up to the private sector to create the means for private aggregate expenditures to be less dependent on government policies which aimed at 'stabilizing' aggregate demand. The result was an increase in private spending on goods and services, relative to what would have been the case otherwise.(13) The economic crises of the 1970's and early 1980's would have been undoubtedly much more severe had the aggregate demand been unassisted by the private financial sector's creation of money.

The creation of private supply of money should be completely determined by the private demand for money in excess of what the government supplies at any given period of time. The cost of supplying an extra dollar either privately or publicly is almost zero. However, it has been argued that the creation of money by the private sector (the multiplication of money) is proportional to the state supply of money. If this were true, then the money supply of any definition would be proportional to the monetary base. But the growth of M2 and M3 has not been the same as M1.

Thus, the private supply of money is related to that part of private demand for money, which is not satisfied by the monetary

(13) This has resulted in a drastic cut of per capita savings in a number of countries. The whole idea of consumerism relates to this easiness of credit by the private financial institutions.

base, i.e., the state supply of coins and notes. We may then divide total money supply(MS) into two components: state money supply(MSS) and private money supply(PMS):

$$MS = MSS + PMS$$

In equilibrium the total demand for money(MD) should be equal to the supply of money:

$$MD = MS = MSS + PMS$$

The private supply of money is then, equal to the demand for money minus the state money supply:

$$PMS = MD - MSS$$

The above expression shows that private money supply adapts completely to the demand conditions, which is true only when the creation of money by the private sector is totally unconstrained. The state can regulate private money supply even though it does not directly control it. For empirical research the state money supply is equal to a narrow definition of money, such as the monetary base or M1.

3. Money Demand

It is almost impossible to find another macroeconomic equation that has received so much attention as the one that attempts to describe the demand for money. There are numerous empirical and theoretical studies that aim at explaining the determinants of the

demand for money.(14) The first debate between Monetarists and Keynesians was based mostly on this single equation and more particularly on its interest elasticity. It was argued that fiscal policy could be effective as long as the demand for money is interest-elastic while, if it is not, monetary policy could be effective.

Individuals demand money for a number of reasons but the role of money as a medium of exchange is the basic service that money offers and the one which makes it desirable. This role of money is recognized by every economist.(15) The amount of money in circulation should be proportional to the volume of transactions to be carried out in a certain period of time. The degree of proportionality is given by the so-called velocity of money, i.e., how many times money changes hands in a given period of time. This type of demand has been called the transactions demand for money and its importance has been recognized by every monetary theorist.(16) The higher the level of transactions to be carried out by money, the higher the demand for money. In advanced countries where the increasing division of labor has multiplied the amount of transactions, money is used in almost all transactions. On the other hand, in subsistence economies, where individual production satisfies almost all the needs, the exchange

-
- (14) Laidler(1986) provides a very good survey of these studies.
(15) The advantages of an exchange(money) economy over a barter economy are discussed by Niehans(1978, ch. 6), Brunner and Meltzer(1971), Vickers(1979). A rigorous proof is given by Starr(1972), Ostroy(1973), and Ostroy-Starr(1974). The utility of money can be derived from a general equilibrium-utility maximization framework. Patinkin(1965) is credited as the first to introduce this type of analysis.
(16) The transactions demand for money has been developed by Baumol(1952) and Tobin(1956).

of goods has a limited role. Thus, advanced countries with a higher division of labor require a higher amount of transactions and therefore more money. But a higher division of labor implies higher income. Thus, income should explain a great portion of the transaction demand for money.

Wealth has been considered a substitute for income in the demand for money. There are two types of wealth that have been included in the demand for money. First, physical wealth has been included in the demand for money. The argument is that an increase in wealth will increase the demand for money because a portion of wealth is held in terms of money. This approach assumes that money is an asset in addition to being a mean of exchange. This differentiates wealth from income because the latter was considered only as part of the transaction demand for money.(17) Thus, money is a store of value in addition to being a medium of exchange with very important policy implications. If wealth plays a role in determining the demand for money, fiscal policy could be ineffective, while if wealth does not play a role, then portfolio crowding-out cannot occur and fiscal policy is effective.(18) The only problem is that physical wealth and income are expected to be correlated because income is the flow that arises from wealth(stock). Thus, higher levels of wealth should be associated with higher levels of income.

(17) Money as an asset part of the individual wealth was suggested by Duesenberry(1963), which is Keynes' speculative demand for money.

(18) The wealth effect and the implications for fiscal policy are examined by B.M.Friedman(1978, pp.620-621) and Venieris(1978, pp.488-502).

The second type of wealth that can play a role in the demand for money is human wealth. Higher human wealth raises individuals' permanent income and thus increases the demand for money.(19) Again human wealth is highly correlated with either total wealth or income. Permanent income, the return to human wealth, makes little difference if it is proxied by current income.(20)

To sum up, human wealth, physical wealth, and income are all considered scale variables, which can be used to explain the transactions demand for money. If these three variables are used in a pair or all together in the demand for money, then a strong intercorrelation between these variables should be expected because all they may reflect is the transaction demand for money.

Individuals have a choice between holding money with the inflation and deflation rate as its rate of return, or other assets with a rate of return equal to the market rate of interest. Thus, the interest rate is the opportunity cost of holding money, which explains the foregone income. The higher the interest rate, the lower the desire to hold money and vice versa.(21) Different demand for money functions distinguish between short and long run interest rates or between the return on bonds and capital, but these are questions that can be answered on empirical grounds. Theory can accommodate the empirical findings, but it is not always successful. Thus, the proposition that seems to be settled in monetary economics after many empirical studies is that there

(19) Human wealth as an argument in the demand for money has been discussed in Meltzer(1963), Laidler(1966), Syring(1967), and Laumas and Ram(1980).

(20) See Goldfeld(1973), p. 628.

(21) A discussion of these points are provided by Laidler(1986)

exists a negative relation between the demand for money and the interest rate.(22)

The rate of inflation and inflationary expectations have been incorporated into the demand for money. The theoretical justification is not well established even though it was found that both play a role. The argument is that the expected inflation rate affects both the rate of return of nominal balances and the real rate of interest.(23) The argument about the price level is less conclusive because it has been argued that individuals demand real balances and not nominal ones as would be the case if the price level had a coefficient different from one in the demand for money function.(24)

A problem of causality arises in the relation between money supply and inflation, which makes the relation positive. It has been argued that inflation is caused by higher money supply, which in our context should include the private money supply, which always accommodates the private excess demand for money.(25) However, in either case the relation between money demand and inflation is positive.

The demand for money can be broken down in terms of sectors or income earners. For example, we can have demand for money coming from households, firms, and government, or we can break it down in

(22) Ibid., p. 130.

(23) Ibid., p. 136.

(24) Ibid., p. 139; Mayes(1981, pp. 188-191.

(25) These arguments were examined in the first chapter. Our distinction can accommodate both the Monetarist and the Post Keynesian. Money supply creates inflation (a Monetarist argument) but this excess supply is created by the modern financial institutions (a Post Keynesian argument).

terms of the functional distribution of national income. This is important for the case of profits, which can affect the demand for money through the short run financial needs of business. A higher expected rate of profit will induce the capitalists to invest more. This new investment needs financing. One way to do it is through internal financing. Alternatively, they could finance it by borrowing. Modern financial institutions have been able to accommodate this need. There is a very strong relation between the needs of financial and industrial capital. Banks have played an important role in creating the necessary credit for the industrial sector. Thus, the rate of profit and the demand for money are positively correlated.

The real need of capitalism for capital accumulation, and the way it is financed in its current stage of development, integrate the real sector of the economy with the monetary sector. The need for a more monetized economy (an increasing demand for money) can be seen through the need of capital accumulation and the furthering of the division of labor. The latter had started even before capitalism had emerged as a dominant mode of production. As it was explained in the introduction, the link between capital accumulation and money is what makes the latter so important in a capitalist society. Money facilitates the accumulation of the surplus of small savers, and thus its exploitation by the large financial institutions. This form of extracting surplus for capital accumulation can take two forms. First, the organization of modern enterprises facilitates the accumulation of capital by selling part of the assets of the firm through the different types of stocks. This source of fund creation is further enhanced by

the ability of these enterprises to control the rate of return of these stocks, which is assisted by government policies for retained profits. Second, capital can be accumulated through the savings, forced or not, of working people who are unable to undertake any investment activity themselves. Here is where the role of financial institutions has become so important in collecting these funds and allocating them for use by the industrial sector. How then, can we explain the demand for money for capital accumulation purposes? Money facilitates and increases capital accumulation, which implies a positive relation between the demand for money and capital accumulation. But the drive for more capital accumulation can take place only if the expected return is relatively high. However, the rate of return on capital is the rate of profit. Thus, we established again a positive relation between the rate of profit and the demand for money.

The demand for money(MDP) depends upon the level of aggregate economic activity(Y), wealth(V), profits(PRO) and the inflation rate(PGR):

$$MDP = MDP(Y, V, PRO, PGR)$$

$$+ \quad + \quad + \quad +$$

The interest rate is not included directly in the demand for money because it is already taken into account in the profit rate. An alternative way is to assume that the relative variable is the actual profit rate minus the interest rate. In this case the negative relation between the demand for money and interest rate holds.

4. The Money Market

Money market equilibrium has been the cornerstone of conventional macroeconomics. The so-called LM function, which has been very important for textbook macroeconomics, described an equilibrium in the money market for different levels of interest rates and aggregate economic activity. As it was mentioned above, this equilibrium was assumed to be demand-determined since the supply of money was taken as fixed. In our model, money supply is not fixed, but is endogenously determined and responds to a number of variables that describe the state of the economy. On the other hand, the demand side of the money market is important as well, a fact that has been emphasized by the conventional macroeconomic approach.

There are three factors that can affect the money market: first, the adjustment of the demand for money which is taken to be privately determined; second, government policy to supply currency and how this policy is adjusted under different economic circumstances; and third, the ability of the private sector to multiply the monetary base in order to meet any excess demand for money.

But why is money market so important? How do problems in the money market can affect the real sector of the economy? The answer to these questions is related to the role of money in the production process analyzed in the introduction of this chapter. Money is the form in which the economic surplus appears in our modern monetized economies. Capital accumulation can be affected

by the amount of money in circulation in a number of ways. Suppose that at a given period of time more money is supplied than what is the 'optimal' demand for it. An increase in the excess supply of money increases the money-capital available in the economy, be it private or state. This 'artificial' increase in the investment funds will decrease the rate of profit and thus the demand for money which in turn will increase even further the excess supply of money, the end result being a decrease in investment. An increase in money supply can occur if private, public, or both supplies increase. However, the private always accommodates the difference between the private demand and state supply. An increase in state money supply will ceteris paribus decrease the private supply, bringing equilibrium in the money market.

The stagnation of the economy described above greatly depends upon the reaction of aggregate demand. If aggregate demand accommodates this stagnation, then recession or depression is unavoidable. However, an excess supply of money can boost aggregate demand, which facilitates the realization of and the increase in the level of profits. Thus, an excess supply of money can have two opposite effects that bring equilibrium between the demand and supply. The decrease of the profit rate due to an increase in the capital accumulation through an excess supply of money is matched by an opposite effect on the rate of profit and thus the demand for money, which comes from the increase in the aggregate demand because more purchasing power in the form of money is in the hands of the consumer. In this case, the excess supply of money can be absorbed by a higher level of economic

activity. However, an excess supply of money is unlike to occur, given that the state money supply is endogenously determined and the private sector is able to adjust its supply to any discrepancy between the demand for money and state money supply.

An excess demand for money may create instability in the money market but this is a less likely situation. There are two reasons for this. First, the state money supply responds more easily to upward pressures on the money supply than on downward pressures. Second, the private supply of money can accommodate any excess demand for money relatively easy. Nevertheless, it is of theoretical interest to apply the above analysis to the excess demand case. A higher demand for money for capital accumulation purposes can be understood only in the case of a relatively high rate of profit. A high level of potential profits will remain, if no more money is thrown into the economy either through the increase in the supply of money or imports of capital. However, if neither happens, the effect on the economy will not be worse or better than what it is already. The only cost is a loss of an opportunity for higher economic growth or development. On the other hand, the aggregate demand side of the economy can be affected, if this excess demand for money is the result of an excess demand for goods and services. If this excess demand for goods is above the economy's capacity to produce these goods, then the 'disequilibrium' in the money market stabilizes the goods market. If, however, there is an underutilization of the economy's resources, then this unsatisfied excess demand for money retards

the rehabilitation of the economy.(26)

The above analysis suggests that money market equilibrium appears to be easily attained or if it does not exist, it might not have serious effects on the real sector. This is true only if the acceptable means of exchange remains as such throughout the adjustment process and can help to overcome economic crises once it is properly managed. However, a loss in confidence in the medium of exchange can be the beginning of an economic crisis but money itself cannot generate an economic crisis without an effect on the real variables such as the rate of profit(the capital accumulation process) or the exchange process (realization of profits).

Conclusions

The basic contribution of this chapter has been the distinction between private and state money supply, which were made endogenous. Furthermore, we emphasized the institutional nature of private money supply, which adjusts to accommodate any need for money by the private sector which exceeds the state money supply. This makes private money supply a residual which is determined after money demand and state money supply is determined. The private demand for money has received a lot of attention and has been well specified. However, we added a key variable in the demand for money which has been previously ignored, i.e., the rate

(26) This reasoning might explain the recession of the 1970's and the 1980's because monetarist policies (policies to decrease money supply) might have decreased the consumer spending and therefore reduced aggregate demand.

of profit.

State money supply is taken as completely endogenous. Finally, we discussed money market equilibrium. The point that has been underestimated is that the money market is related to the real sector of the economy through the capital accumulation process and it is this channel that can be the source of an economic instability.

This chapter completes the presentation of our small macroeconometric model. In the next chapter we bring together the entire model and discuss its over-all interrelationships.

C H A P T E R N I N E

THE OVERALL MODEL

Introduction

Macroeconometric models have mushroomed in the last thirty years. The development of economic analysis and the applications of computer technology have been the two main reasons for this astonishing increase in the number of macroeconomic models for econometric purposes.(1) This expansion has taken two directions. First, macroeconometric models have become more disaggregated by including as many sectors of the economy as possible. Second, an attempt has been made to improve the specification of the individual behavioural equations that are included in the model. The latter has been encouraged by new estimation methods such as non-linear estimation and by simulation. The model we developed in the previous three chapters is relatively small in its size, but nevertheless contributes to both aspects of the growth of macroeconometric models.

First, our model provides a complete specification of the direct government economic activities. macroeconometric models. It incorporates the government sector as an endogenous supply-side economic entity. It will be shown how this improves the specification of the government sector and will result in a better understanding of the government's role in policy analysis. There is nothing new in that government produces goods and services, but up to now this has either been ignored or not treated as

(1) A history of these models is provided by Bodkin, et al.(manuscript).

endogenous in the practice of macroeconometric modelling.

Second, the model presents a better specification of those economic categories that are relevant to policy analysis. Its main purpose is to show the extent of government direct and indirect economic intervention and how it serves macroeconomic policy. This specification enhances the policy options available to policy-makers. The conventional approach was to include indirect demand management policies, i.e., the multiplier. In our model the different types of government policies are made endogenous and are completely specified.⁽²⁾ Thus, we include direct demand and supply state activities as endogenous. We also include indirect policies, such as the state money supply.

In the first part, of this chapter, we present the over-all model, which includes all the equations presented in the previous three chapters plus the identities and the equilibrium conditions. In the second part, we analyze the various sectors of the model and their interrelationships. In the final part the goals of the model are examined, as well as possible extensions.

(2) We should mention here that not all indirect government economic activities are specified because would have made the model unnecessarily large. Our goal is to emphasize the direct state economic activities, which up to now have been ignored.

1. Structural Equations

In the previous section we presented all the behavioural technical relations of our model for both the private and the state sector. The entire model is reproduced here:

private consumption function

$$CP = CP(W, PRO, V, PGR) \quad (1)$$

state consumption function

$$CS = CS(Y, UR, CP, PGR, D) \quad (2)$$

private investment function

$$IP = IP(PRO, Q) \quad (3)$$

state investment function

$$IS = IS(IP, V, UR) \quad (4)$$

total exports function

$$E = E(YF, PE, ER) \quad (5)$$

total imports function

$$IM = IM(Y, PIM, ER) \quad (6)$$

private labor demand function

$$LDP = LDP(WRP, PRO, E, SC+SI) \quad (7)$$

state labor demand function

$$LDS = LDS(UR, Y, WRS, PRO, WRP) \quad (8)$$

total labor supply function

$$LS = LS(WRP, WRS, POP, TUR) \quad (9)$$

private output production function

$$Y_P = Y_P(K_P, L_{DP}) \quad (10)$$

state output production function

$$Y_S = Y_S(K_S, L_{DS}) \quad (11)$$

price of private output function

$$P_P = P_P(WRP, CII, Y_P/POP) \quad (12)$$

price of state output function

$$P_S = P_S(PGR, D, WRS) \quad (13)$$

state money supply function

$$MSS = MSS(D, PGR, UR, Y, V) \quad (14)$$

private money demand function

$$MDP = MDP(Y, V, PROR, PGR) \quad (15)$$

where:

CP: PRIVATE CONSUMPTION
CS: STATE CONSUMPTION
CII: COST OF IMPORTED INPUTS
D: BUDGET DEFICIT
DP: DEPRECIATION OF THE STOCK OF PRIVATE CAPITAL
DS: DEPRECIATION OF THE STOCK OF STATE CAPITAL
ER: EXCHANGE RATE
E: EXPORTS
IM: IMPORTS
IP: PRIVATE INVESTMENT
IS: STATE INVESTMENT
KP: PRIVATE STOCK OF CAPITAL
KS: STATE STOCK OF CAPITAL
LDP: PRIVATE LABOR DEMAND
LDS: STATE LABOR DEMAND
LS: TOTAL LABOR SUPPLY
MDP: TOTAL MONEY DEMAND
MSS: STATE MONEY SUPPLY
MSP: PRIVATE MONEY SUPPLY
PE: PRICE OF EXPORTS
PGR: INFLATION RATE
PIM: PRICE OF IMPORTS
POP: POPULATION
PRO: TOTAL PROFITS
PP: PRICE LEVEL OF PRIVATE PRODUCTION

PS: PRICE LEVEL OF STATE PRODUCTION
 Q: CAPITAL INTENSITY
 RRK: RATE OF RETURN ON PRIVATE CAPITAL
 TUR: RATE OF UNIONIZED TO NON-UNIONIZED WORKERS
 UR: UNEMPLOYMENT RATE
 V: WEALTH
 W: WAGES
 WAP: PRIVATE AVERAGE WAGE
 WAS: STATE AVERAGE WAGE
 WP: PRIVATE WAGES
 WRP: PRIVATE WAGE RATE
 WRS: STATE WAGE RATE
 WS: STATE WAGES
 Y: TOTAL OUTPUT
 YF: FOREIGN LEVEL OF OUTPUT
 YP: PRIVATE OUTPUT
 YS: STATE OUTPUT

The total number of behavioural equations is fifteen. These behavioural relations are divided into nine equations describing the behaviour of the private sector (equations 1, 3, 5, 6, 7, 8, 9, 10, 12, 15). The remaining six behavioural equations describe the state economic activities in the demand, supply, and the monetary sector.

Two more behavioural equations could have been added to describe direct state economic activities in the export and import sector. In other words, exports and imports can be divided into their state and private components. The reason we leave out this distinction is that state exports and imports are relatively small and we assume that they are independent of short-run policy concerns, which are the main focus of our model. Another alternative is to assume that state exports and imports are determined by the same factors that influence private exports and imports. This assumption is particularly applicable to a small open economy.

The above fifteen behavioural equations do not complete the presentation of the model. It is common practice in macroeconometric models to present a number of equilibrium and identity relations. Their number depends on how many variables are determined by the model. We can distinguish three types of variables. First, there are endogenous variables, which are determined by economic factors, i.e., they are determined by the model. Second, there are exogenous variables, which, it is assumed, are determined outside the model. Third, we can define predetermined variables, which can include all the exogenous variables and the lagged endogenous.

The model has forty-two variables. There are sixteen exogenous variables and twenty-six endogenous variables:

Exogenous: V, D, DP, DS, YF, PE, PIM, ER, WRP, WRS

POP, TUR, CII, WAP, WAS, RRK.

Endogenous: CP, CS, IP, IS, E, IM, YP, YS, LDP, LDS, LS, PP, PS, MSS, MDP, Y, PGR, MSP, UR, KP, KS, PRO, WP, WS, W, Q.

The twenty-five endogenous variables are determined by the fifteen behavioural equations presented above and by the following ten equilibrium and identity relations:

$$Y = CP + CS + IP + IS + E - IM \quad (16)$$

$$PGR = (YS/Y)(PS(t)/PS(t-1) - 1) + (YP/Y)(PP(t)/PP(t-1) - 1) \quad (17)$$

$$PMS = MD - MSS \quad (18)$$

$$UR = (LS - LDP - LDS) / LS \quad (19)$$

$$KP = (1 - DP)KP(t-1) + IP \quad (20)$$

$$KS = (1 - DS)KS(t-1) + IS \quad (21)$$

$$Q = KP / (KP + WP) \quad (22)$$

$$PRO = RRK*KP \quad (23)$$

$$WP = WAP*LDP \quad (24)$$

$$WS = WAS*LDS \quad (25)$$

$$W = WP+WS \quad (26)$$

Equation (16) is the total expenditures identity. In equation (17), the inflation rate(PGR) is a weighted average of the state price level and the private price level. Their relative weights are the shares of state and private output to the total output. In equation (18), as explained in chapter eight, private money supply is determined by the level of state money supply minus the total money demand. Equation (19) defines the unemployment rate as the ratio of unemployed to labor supply. Equations (20) and (21) give the net stock of capital, private and state, respectively. The remaining equations define total profits, private wages, state wages and total wages.

The above equations complete the presentation of the model. It is this model that we estimated, using the experience of the Canadian economy in the 1970's and the 1980's. The results are presented in the next chapter. Now we proceed to discuss the various sectors of the model and show their interrelationships.

2. The Sectors of the Model

The over-all model we presented in the previous section consists of two main sectors that characterize the real part of the domestic economy, a third sector linking the domestic economy

to the foreign economies and a fourth sector describing the financial sector. The first two sectors have been completely specified at the aggregate level of their activities. These are the private and the state sector.

In any macroeconometric model of a mixed economy, the private sector plays a fundamental role. Important decisions such as consumption, investment, output production, and employment depend on the behaviour of private individuals. All these private economic activities have received great attention by the theory and the practice of macroeconomic policy. In most advanced capitalist countries, private consumption and investment constitute the most important component of aggregate demand. Their fluctuations become the source of a demand-side economic crisis, which becomes a concern of macroeconomic policy. These two functions play an important role in our model. Both of them depend on profits, which is the driving force in a capitalist economy. On the other hand, total wage payments do not directly affect investment, but do directly affect consumption. It is only profits and capital intensity that directly affect capital accumulation. The supply-side effects of private decisions are given by three relations: the demand for labor, the production of output and the pricing of private output.

The state sector is represented by the same number of equations in both the demand and the supply side of the economy, as is the private sector. The demand side includes a state consumption function and a state investment function. Both constitute a small part of aggregate demand relative to private aggregate demand but they are large enough in most advanced capitalist countries to be

used in stabilizing aggregate demand. The state sector plays an active role in the supply-side of the economy as well. In our model this is reflected by three equations: a state labor demand, a state production function and a relation that determines the pricing of state output. All state economic activities depend on two types of variables: policy and non-policy concerns.

The third sector of our model is the one which links the domestic economy with international trade. Aggregate relations for imports and exports describe the entire sector. No distinction in the trade sector has been made between private and state for reasons we explained in the previous section.

The last sector of our macroeconomic model is the monetary sector. In this sector the distinction between state and private is emphasized for money supply, where both are endogenously determined by the model. The private and the state money supply are set equal to the total demand for money. The latter is made a function of profits. On the other hand, state money supply depends on the two types of variables that all state economic activities depend upon: policy and non-policy variables. However, in the last two decades, state money supply has become the most important indirect instrument of macroeconomic policy. Thus, the policy variables are expected to play an important role in determining the level or the growth rate of state money supply.

All four sectors are interrelated. For example, the private sector's decisions affect the decisions of the policy-makers, who set the level of state economic activities, which in turn affect the decisions of the private agents. We can illustrate this

interdependence by using as an example aggregate consumption (private plus state consumption). At any given period of time, the private sector decides how much to spend for current goods and services. If this level is considered as non-optimal by the policy-makers, they can adjust accordingly decisions regarding their direct economic intervention, i.e., state consumption or indirect economic intervention, such as taxes on wage income. However, this change in state economic activities leads the private agents to re-evaluate their consumption decisions, because their relative economic situation has changed. This interdependence between the private and the state sector applies not only to aggregate consumption but also holds true for any aggregate relation.

3. The Scope and Extensions of the Model

An econometric model can be used for three purposes. First, it can be used for purely theoretical reasons. These can take two forms. One is to demonstrate the application of econometric models. A good example of such a model has been the use of Klein I model. The other form is to verify empirically theoretical hypotheses. This is the most important use of econometric models at this early stage of its development. Second, an econometric model can be used for policy analysis. A model is required for this purpose because it is the only way that macroeconomic policy can be applied. It is not surprising that Tinbergen's classic work On The Theory of Economic Policy uses a small macroeconometric model to derive quantitative results for policy applications.

Third, a model can be used to forecast the future course of the economy. Forecasting with econometric models has become a separate field.(3)

The three purposes of an econometric model are not easily distinguishable from each other. The purpose of forecasting is related to the policy scope of the model. To forecast the future course of an economic variable, which is an element of the policy-maker's objective function, becomes very important for an effective macroeconomic policy because the effects of a policy action are realized with a certain time lag. For example, a good forecast of the level of output or unemployment will be a good guide to today's policy-making since it takes time to affect these variables. The same interdependence exists between the theoretical part and the other two uses of an econometric model. Thus, an econometric model should be able to explain so that it can be used for policy analysis, which is the case only if a model is capable of forecasting very well.

But what are the purposes of the model we developed in the previous three chapters? If we have to rank the importance of the three purposes we previously discussed, then our model has been developed primarily for theoretical analysis and policy evaluation. However, as we shall explain, these two purposes are more strongly interrelated in our case than in any other model. We have attempted to show that the government economic policy had not been fully explained and analyzed. Policy-making has more

(3) All the three purposes of econometrics models are extensively discussed in Intriligator(1978, chs 14, 15, and 16)

options than what the conventional theory of economic policy assumes.(4) By generalizing the theory of economic policy, it allows policy-makers to choose from a greater number of policies. This theoretical innovation is the result of our empirical observation that the modern state has direct and indirect economic effects on both the demand and the supply side of the macroeconomy. As we shall see in the next two chapters, the direct supply state economic intervention has been more important than the corresponding one in the demand side of the economy.(5)

The new approach to the theory of economic policy we developed in part I has influenced our model of the macroeconomy. The macroeconometric model developed in the last section incorporated all the alternative government effects at the aggregate level. The model can be useful in a number of different applications:

- (1) To model different socio-economic systems, i.e., mixed economies and centrally planned economies.
- (2) To model the economies of countries with different level of development and therefore different types of government intervention.
- (3) To show the extent of government intervention both as a direct and indirect economic actor.
- (4) To show to what extent policy-makers have aimed at affecting

(4) Conventional is meant to include all the theories examined in the first chapter.

(5) Since our model is estimated for the Canadian experience, this applies only to Canada. However, it our contention that this should be true for other advanced capitalist countries.

the demand or the supply side of the economy. In other words, to what extent have they followed Keynesian policies (demand management policies) or other policies, including supply management.

(5) To show the relative efficiency of government production relative to the private sector, as well as the types of goods that the state sector undertakes, i.e., increasing returns to scale, more labor intensive, public goods, etc.

(6) To show the government's economic reactions to short- and long-run policy concerns, i.e., unemployment, inflation, economic growth, development, external economic dependency, etc.

The model we presented in the previous section can be extended in a number of ways to accommodate the needs of the particular researcher or the economic reality of a particular country. Some of these possible extensions are:

(1) The model can become more dynamic by including lagged variables in a number of equations, such as consumption and investment.

(2) Some variables can be changed to incorporate uncertainty and therefore to utilize expected values, such as expected profits in the investment function.

(3) Other variables that are treated as exogenous can become endogenous by increasing the number of equations, such as private and state depreciation, import and export prices (the LINK model), etc.

(4) The financial sector (national and international) can be included, i.e., government bonds and private asset demands. This will make wealth an endogenous variable.

(5) The structure of output can be broken down into disaggregated sectors such as agricultural, industrial and services.

We should note that the small-medium size model we presented can be extended and disaggregated but what is important is that, for each private economic activity, a corresponding state economic activity should be specified. This is necessary because the private sector's objectives are not the same as the government's.

Conclusions

The over-all presentation of the macroeconometric model was the main purpose of this chapter. We distinguished four sectors of the economy that are explicitly specified by our small macroeconometric model. The most important of these are the state and the private sectors, which influence both the supply and the demand side of the economy. The interrelationships of these two sectors were also emphasized and it was concluded that their economic actions are simultaneously determined. Finally, we examined the scope of our model. Its purpose is twofold: first, we want to use the simple model to ascertain the actual policy performance and second to design policies which can better deal with the problem of inflation, unemployment and economic growth.

CHAPTER TEN

STRUCTURAL ESTIMATION

Introduction

The complete model we presented in the previous chapter is estimated and simulated in this chapter. We use the Canadian economic experience in the 1970s and the 1980s to find parameter estimates of the model's behavioural equations. The Canadian experience can be considered as typical of an advanced capitalist country in terms of the economic problems it had to deal with during this period. Problems such as unemployment, inflation, the external deficit, economic growth and public deficit were common for most advanced capitalist countries. The access to data was one of the most important reasons Canada was chosen. However, other reasons are important as well. One of them is the extent of economic intervention(direct and indirect) by the Canadian state, broadly defined to include the federal, provincial and municipal governments.

This chapter is divided into four sections. The first examines some aggregate economic indicators of the Canadian economy in the last fifteen years. The second section gives the statistical definitions of the data used for estimating and simulating the model. The third specifies the entire model developed in the previous chapter with a few adjustments to suit the Canadian economic reality. The final section presents the results of parameter estimates of the model.

1. An Overview of the Canadian Economy

In this section we attempt to present briefly an outlook of the Canadian economy in the 1970s and the 1980s. This period covers 18 years which can be considered as the most troublesome ones since the Great Depression of the 1930s. The main characteristics of this period are the breakdown of the International Monetary System (the Bretton Woods Agreement), the increases in the price of oil, and the shift in emphasis in the policy-makers' objectives (from unemployment and growth to inflation) and policy instruments (from fiscal to monetary policy). These were common more or less to all the advanced capitalist economies including the Canadian.

However, the Canadian economy had to deal with additional problems, given its unique characteristics. Canada is a small, open, advanced capitalist economy. It relies heavily on the economic conditions in the U.S., since the U.S. is Canada's main trading partner and the U.S. economy is much larger than the Canadian economy. This makes Canada's economic policies heavily dependent on economic fluctuations in the U.S. We summarize the Canadian economic situation in terms of the actual behaviour of three key economic indicators: unemployment, inflation, and output growth.(1)

(1) We do not review macroeconomic policy actions. These are examined in the next chapter where we use the estimated model to infer the policy actions rather than relying upon government announcements and programmes. Our approach follows the time-honored tradition in economics, which is to deal with facts rather than political statements.

Unemployment has been the major macroeconomic problem. In 1971 the unemployment rate stood at around 6% and was considered very high, relative to post war standards. In the early 1980s the unemployment rate reached record levels which were second only to the 1930s.(2) It would come as a surprise if the goal of macroeconomic policy for this period was not to reduce the unemployment rate.

Inflation has been fluctuating during this period. In the beginning of the 1970s inflation was not the concern of policy-makers. In 1974 it reached a double digit level of 11% but by the fourth quarter of 1976 it dropped to 6%. Since then it has been escalating, reaching a record high(13%) for the entire period in 1981. Since 1982 it has been decreasing, reaching a level well below 5%. This reflects the fact that inflation, for a number of reasons, has been the priority of Canadian macroeconomic policy in the period of this study.

The growth of output has followed the same pattern as all the other economic indicators during this period. The entire period is marked by three slow-downs of economic growth: 1972-73, 1977-78 and 1982-1984. This trend in output growth is strongly related to fluctuations in the profit rate. Output slow-downs are preceded by low rates of profit. In the 1970s the lowest profit rate occurred in the fourth quarter of 1976, at 5.9%, and the economy continued at around this low level until it got out of the 1978 recession. However, in the beginning of the 1980s the profit rate

(2) We should note that the labor supply increased considerably during this period. In 1971 it was 8.5 million, while in 1984 was close to 12.5 million.

fell steadily and never exceeded 6%, which explains why the last recession was so severe and persistent. The lowest rate occurred in the fourth quarter of 1982, at 3.4%

All these alleged policy goals of unemployment, inflation and economic growth were widely fluctuating in the advanced capitalist countries during the period after the year 1970. This was supposed to result in intensive policy actions to stabilize the economy, which was true for all the advanced capitalist countries, with very few exceptions, such as Austria and Switzerland. In addition, the Canadian economy had to deal with structural problems, such as its dependence on the United States, its fiscal structure (budget deficits) and its industrial development. These concerns have preoccupied, in one way or another, policy-makers during this period. The most important of them has been the public deficit.(3) However, the problem of economic dependence on the United States is not of lesser importance, and thus has initiated negotiations on free trade between Canada and the United States. The share of merchandise exports going to the United States have been increasing and have reached a level higher than 70% of total exports in 1983.(4) This is very important because exports represent almost 30% of total economic activity in Canada.

Industrial development has been another important policy issue. This is almost unique for Canada, since it has abundant natural resources. The need for capital to exploit these resources is one

(3) In 1984 the newly elected government made the deficit one of its main policy targets; see Wilson's (Minister of Finance) address of November 8, 1984 'A New Direction for Canada'.

(4) See the Finance Minister's report(1984, p. 34).

of the policy concerns. However, this period is marked by a decrease in the utilization of existing capital. In the fourth quarter of 1982 only 65% of existing capital was utilized. This was the lowest for the entire period under consideration. The highest utilization rate was around 80%.

Recapitulating, the Canadian economy in the 1970s, and primarily in the early 1980s, was in a state of economic crisis. All major economic indicators point out this undisputed fact. This has called for active government intervention. Estimates of the simple model in this chapter and the policy analysis of the next will enable us to verify from the 'facts' whether macroeconomic policy has used all the available policy tools to stabilize the economy. It will also reveal the priorities of the policy-makers and how these have changed during this period of economic crises. The next section analyzes the source of data used for estimating the model and for the policy analysis.

2. Sources of Data

One of the most important problems empirical economic research faces is the existence and the reliability of the appropriate data. In most cases compromises had to be made due to the unavailability of data on a particular series. In our research the problem was more acute because we deal with sectors of the economy that have received little attention in the past. The state sector and the supply side of any advanced capitalist economy have been neglected in comparison to the demand side of the economy. The influence of Keynes' economics is the reason for this preference by statistical authorities. In this section we provide the statistical definitions of the variables used for estimating the model summarized in the previous chapter.

The national accounts are well-developed for the demand side of the economy, at least for the purposes of this study.(5) Hence, we had no problem in finding the variables of the demand side which are related to the private sector. Private investment and consumption are taken from national accounts.(6) Private consumption is defined as personal expenditures on goods and services (D20032). Private investment is defined as business fixed investment plus any changes in inventories (D20036+D20041). State investment has been defined as government investment in fixed capital (D20034+D20035). State consumption has been defined as current expenditures which does not include payments on wages

(5) We are always referring to the Canadian case.

(6) Most of the time series were taken from Cansim, the University Base. The numbers below refer to the Cansim series.

and capital goods. State consumption therefore, is equal to total current government expenditures(D20033) minus government expenditures on wages (D20090+D20091). To complete the expenditures side of the economy we added exports(D20044) and subtracted imports(D20048). Finally, income was defined as the sum of private and state consumption (including expenditures on wages) and investment plus exports minus imports.

The income side of the economy is divided into wage and profit income after taxes including the net transfers from all levels of government.(8) However, we should say a few words about the definitions of wages and profits used in this study. First, the reason we used the data from national accounts is because we wanted to be consistent with the expenditure side of the economy. Second, alternative data are not readily available. The problem is that profits are underestimated because part of these payments are paid out as extraordinary wages. For example, the salaries of senior managers and bureaucrats are part of wages even though a substantial portion of them may in fact be disguised profits. Another element of profits is that various business expenses for tax purposes may have artificially become part of wages (cost) even though they are part of profits. However, our results with these definitions are relatively good even though a better, but unavailable, time series for profits may have provided much more

(8) Wages = Wages, Salaries and Supplementary Labor Income(D20088) + Military Pay and Allowances(D20091) + Current Transfers from Government to Persons(D20098+D20101) - Direct Taxes to Persons(D20173) - Current Transfers from Persons to Government(D20178).

Profits = Corporation Profits after Taxes(D20262).

reliable results.

The production side of the economy is where we encountered the most difficulties. Not all government variables of the supply side of the economy are easily measurable and various definitions can give drastically different results. There were three state variables on the supply side: state labor demand(SLD), state output(SY) and state capital(SK). All three had to be consistent. First, state capital growth had to be consistent with net state investment taken from the national accounts. Second, state capital had to match both state labor and state output. In other words, the production of state output had to be consistent with the two inputs: state capital and state labor demand. The corresponding variables for the private sector were easily calculated by subtracting the state variables from the total variables on the national statistics.

State output was defined as the sum of government expenditures on goods and services, including wages and salaries (D20162) plus government consumption allowances(D20169) plus government investment income(D20160). State capital and private capital were estimated using the method of 'perpetual inventory' of Statistics Canada and their 1970 figures for capital stock. This method involves the accumulation of net investment (see series 13-568, Statistics Canada). Net investment for both state and private investment were calculated from gross investment (previously defined) minus capital consumption allowances (D20169 and D20009).

State labor demand had to be consistent with state investment and state output. It had to include employment in all three levels

of government (federal, provincial, and municipal). This data were taken from Statistics Canada (publication series: 72:004, 72:007, 72:009). The data were seasonally adjusted. Private labor demand was defined as total labor demand(D767608) minus the state labor demand.

The monetary variables reflect quite well the theoretical concerns developed in chapter eight. The state money supply is defined as monetary base(B1604). The demand for money was defined as M3(B1628). The difference between money demand and state money supply defines private money supply.

The other variables were easily calculated from the Cansim Series or were taken from the Bank of Canada's quarterly model. Wealth, the private wage rate, the state wage rate, the private price level and the state price level were taken from the quarterly model of the Bank of Canada(RDXF). From Cansim we retrieved the following series: the price level(D484000), the unemployment rate(D767611), the price of imports(D20354), the price of exports(D20351), the budget deficit(D40406), United States output(B51100), the exchange rate(B3400), population(D1). All the nominal rates were deflated with their corresponding price deflators from the national accounts. The remaining variables that are used in the model were estimated by the previous definitions. The measure of capital intensity was defined as the rate of private capital divided by the sum of private capital and private wages. The rate of profit is defined as profits divided by total private wages and capital stock. All the growth rates have been calculated as the rate of the difference of the current quarter value to that of four quarters latter. In this way we take into

account the growth rate over a year.

As a final point of this section, we should say something about our definition of the state variables and the reality of government economic intervention. Our data on the government sector reflects the key elements of our analysis, i.e., direct state economic activities. However, this does not exhaust all direct government economic activities and says very little about indirect economic activities. Bird(1979) and Bird and Foot(1979) have provided a number of interesting calculations and definitions of the various government economic activities. The result has been an overestimation relative to our estimates of all the state economic variables. However, even though their work is fundamental to understanding the nature and the entire extent of government involvement, it is not appropriate for our purposes. Our approach emphasizes the policy role of government intervention and our state economic variables have been defined accordingly. In other words, a state economic activity was included to the extent that it could be controlled by the policy-makers.

3. The Model

Our main purpose now is to develop a model for the Canadian economy, which emphasizes the direct state economic role. This empirical model is based on the theoretical econometric model developed in the previous four chapters. We construct a model of the Canadian economy specifying the government sector as an endogenous direct economic actor in both the demand and the supply

side of the economy. To my knowledge this is the first time that such an approach is followed in constructing a macroeconometric model for the Canadian economy.(12)

However, as we explained previously, the small model we presented can be easily expanded to include other government and non-government economic activities. In terms of government economic activities, it can include more indirect ones (other than the money supply), such as taxes, subsidies to business, and transfers of income. These were left out because the purpose of this model is to incorporate direct state economic activities in a macroeconometric model for policy analysis.

We should note that an extension of our macroeconometric model is possible only if it is consistent with the basic distinctions we have made between state and private economic activities in both the supply and the demand side of the economy.

Another extension can be made in terms of the private sector. We can disaggregate the various private economic activities in both the demand and the supply side of the economy. Again, these extensions will add nothing to our model in terms of its main focus. These extensions can be easily accommodated, but the corresponding state actions should be fully specified. In other words, for each private economic activity a corresponding direct state economic activity should be specified. In addition, a complete model should fully specify all the alternative state

(12) A survey of Canadian macroeconometric models is given by Bodkin et. al.(manuscript). The CANDIDE model does provide a breakdown of government expenditures, but only for the demand side.

economic activities.

We proceed now to present the model used for estimation and simulation purposes (the variable definitions are given below in table 10.1):

$$\begin{aligned} CP &= A_0 + A_1 * LAG_4(CP) + A_2 * W + A_3 * PRO + A_4 * V + A_5 * PGR + A_6 * FOP \\ CS &= B_0 + B_1 * LAG(CS) + B_2 * Y + B_3 * UR + B_4 * PGR + B_5 * DGR \\ IP &= C_0 + C_1 * LAG(IP) + C_2 * PRO_{gr} + C_3 * Q_{gr} + C_4 * LAG_2(IP) \\ IS &= D_0 + D_1 * LAG(IS) + D_2 * IP + D_3 * UR + D_4 * V \\ E &= E_0 + E_1 * LAG(E) + E_2 * YUS + E_3 * PE + E_4 * ER \\ IM &= F_0 + F_1 * LAG(IM) + F_2 * Y + F_3 * PIM + F_4 * ER \\ LDP &= G_0 + G_1 * LAG(LDP) + G_2 * PRO + G_3 * E + G_4 * PWR \\ LDS &= H_0 + H_1 * UR + H_2 * Y + H_3 * SWR + H_4 * PRO + H_5 * WRGR \\ YPL &= J_0 + J_2 * LOG(LDP) + J_3 * LOG(KP) \\ YSL &= K_0 + K_2 * LOG(LDS) + K_3 * LOG(KS) + K_4 * LOG(DUM) \\ PP &= L_0 + L_1 * LAG(PP) + L_2 * WRGR + L_3 * CII + L_4 * YP / POP \\ PS &= M_0 + M_1 * LAG(PS) + M_2 * PGR + M_3 * D + M_4 * SWR \\ MD &= N_0 + N_1 * LAG(MD) + N_3 * Y + N_4 * PROR + N_5 * PGR \\ MSS &= O_0 + O_1 * LAG(MSS) + O_2 * PGR + O_3 * D + O_4 * URGR \\ Y &= CP + CS + WS + IP + IS + E - IMP \\ MSP &= MD - MSS \\ PGR &= (SY/Y) * PSGR + (PY/Y) * PPGR \\ UR &= (LS - LD - SLD) / LS \\ PK &= LAG(PK) + IP - DP * LAG(PK) \\ SK &= LAG(SK) + IS - DS * LAG(SK) \\ YS &= EXP(YSL) \\ YP &= Y - YS \\ PRO &= RRK * KP \\ WP &= WAP * LDP \end{aligned}$$

$$WS=WAS*LDS$$

$$W=WP+WS$$

$$Q=KP/(WP+KP)$$

Where:

A1 to O4 : Coefficients

* : Sign of multiplication

EXP : Exponent

LOG : Natural Logarithm

LAG1 : Lag one period

LAG2 : Lag two periods

LAG4 : Lag four periods

All variables are dated for the period (t) unless otherwise is specified by the lag operators. All equations, with the exception of identities, are multiplied by the coefficients and, wherever applicable, we include the constant.

The first fourteen equations are the behavioural equations of the model. These are similar, but not identical, to the equations we presented in the previous chapter. There are a number of differences: First, we do not include the supply of labor because we assume that the labor market is always in excess supply and thus employment is demand-determined, which is what the Canadian economy experienced in the years we used for estimation (1971i to 1987i). Second, in a number of equations we used growth rates instead of levels for some of the independent variables. Third, some variables that were not significant were dropped out. Fourth, in the state production function we include a dummy variable to take into consideration technological changes. This is simply defined as a time variable. The same variable was not significant

for the private production function. Fifth, in the consumption function the population variable was significant.

4. Structural Estimation

The model was estimated and simulated with non-linear techniques.(13) Our model is non-linear in variables but linear in parameters. Non-linear estimation and simulation techniques for simultaneous models have been developed in the recent years.(14) The model was estimated with four alternative methods: ordinary least squares(OLS), seemingly unrelated regressions(SUR), two stages least squares(2SLS) and three stages least squares(3SLS). The best results were obtained by the second method of seemingly unrelated regressions, using data for the first quarter of 1971 to the first quarter of 1987, but the results with the other methods were not much different.

The results obtained by SUR are reproduced in table 10.1. For each estimation technique we give the statistics for each equation: R-Square, h-Statistic and the Durbin-Watson. The h-statistic is not relevant for the equations of LDS, YPL, YSL and PS because they do not contain any lagged endogenous variable. Then, the parameter estimates follow.

(13) We used MATRIX OPERATION(MATOP) a package developed by Professor Kuiper at the University of Ottawa for most of our quantitative work and Statistical Analysis Systems(SAS) for the non-linear estimation and simulation.
(14) See Goldfeld and Quandt(1972, ch. 8) and Klein(1983, ch. 2).

We will now analyze the results obtained by the SUR method.(15) All the equations of the model are explained very well by their corresponding independent variables. In all but two of the 14 behavioural equations the explanatory variables explain over 90% of the variation in the dependent variables. The only exceptions are private and state investment, which have an R-Square of 83% and 86% respectively. Autocorrelation appears to be a problem in only two equations: private consumption and state money supply. In most cases this is confirmed by the h-statistic because in most equations the inclusion of the lagged endogenous as an exogenous variable biases the Durbin-Watson statistic. The two production functions and state prices have been corrected for first degree autocorrelation. The equations that describe the direct state economic activities appear to have the least problem of autocorrelation. One explanation for this is that private variables were calculated as residuals from the total after we calculated the state ones from the primary sources (see section two of this chapter). Thus, all the 'noise' that might exist in the aggregate data became part of the corresponding private variables.

(15) The results of the other methods are not much different, therefore there is no need for separate analysis.

TABLE 10.1: ESTIMATION RESULTS : 1971i-1987i

NONLINEAR SUR		SUMMARY OF STATISTICS		
Endogenous Variable	Degree of Freedom	R-Square	h-Statistic	Durbin Watson
Private Consumption(CP)	58	99.55	3.7	1.22
State Consumption(CS)	59	82.92	0.41	1.91
Private Investment(IP)	60	93.29	1.15	1.75
State Investment(IS)	60	80.53	-0.79	2.16
Exports(E)	60	98.61	-0.44	2.10
Imports(IMP)	60	98.71	1.87	1.56
Private Labor Demand(LDP)	60	99.66	1.03	1.74
State Labor Demand(LDS)	59	93.04	-	1.40
Private Output in logarithms(YPL)	62	99.41	-	2.01
State Output in logarithms(YSL)	62	98.96	-	1.25
Private Prices(PP)	60	99.97	0.16	1.96
State Prices(PS)	61	99.90	-	1.85
Money Demand(MD)	60	99.64	1.17	1.70
State Money Supply(MSS)	60	98.76	3.5	1.10

NONLINEAR SUR		PARAMETER ESTIMATES	
ENDOGENOUS VARIABLE	PARAMETER ESTIMATE	EXOGENOUS VARIABLE	'T' RATIO
Private Consumption (CP)	A0=224959	Constant	3.61
	A1=0.21	C(t-4)	2.70
	A2=0.64	Total Wages(W)	7.68
	A3=0.33	Profits(PRO)	6.09
	A4=47	Wealth(V)	5.89
	A5=-377	Inflation Rate(PGR) in %	-3.31
	A6=10.38	Population(POP)	3.14
State Consumption (CS)	B0=4965	Constant	4.62
	B1=0.42	SC(t-1)	5.95
	B2=0.020	Income(Y)	4.88
	B3=116	Unemployment Rate(UR)	1.52
	B4=6.31	Inflation Rate(PGR)	-0.17
	B5=12	Growth of Deficit(DGR) in %	0.52
Private Investment (IP)	C0=3834	Constant	1.95
	C1=0.88	IP(t-1)	12.76
	C2=38	Profits Growth(PRO)	4.2
	C3=128	Capital Intensity Growth(Q)	1.3
	C4=0.058	IP(t-2)	0.82
State Investment (IS)	D0=3928	Constant	4.04
	D1=0.68	SI(t-1)	8.44
	D2=-0.0176	Private Investment(I)	-2.25
	D3=-99	Unemployment Rate(UR)	-2.33
	D4=1.32	Wealth(V)	3.11
Total	E0=-33248	Constant	-4.04
	E1=0.77	EX(t-1)	13.35

Exports (EX)	E2=24 E3=-10.6 E4=254	Output of U.S.(YUS) Price of Exports(PE) Exchange Rate(ER)	3.29 -0.34 2.72
Total Imports (IMP)	F0=-31032 F1=0.69 F2=0.19 F3=-200 F4=97	Constant IMP(t-1) Income(Y) Price of Imports(PIM) Exchange Rate(ER)	-5.39 13.19 5.78 -4.18 1.69
Private Labor Demand (LDP)	G0=745 G1=0.87 G2=0.088 G3=0.00062 G4=0.96	Constant LDP(t-1) Profits(PRO) Exports(E) Private Wage Rate	3.74 27.02 5.46 0.63 2.49
State Labor Demand (LDS)	H0=-582 H1=23.27 H2=0.005 H3=-1.25 H4=0.002 H5=15.45	Constant Unemployment Rate(UR) Income(Y) State Wage Rate(WRS) Profits(PRO) Wage Rate Growth(WRGR)	-5.35 4.84 9.21 -4.67 1.83 9.86
Private Output (YP)	J0=2.2 J2=0.67 J3=0.23	Constant Log of Labor Demand(LDP) Log of Private Capital(KP)	5.09 6.48 5.83
State Output (YS)	K2=0.18 K3=0.74 K4=0.34	Log of State labor(LDS) Log of State Capital(KS) Dummy (technological change)	2.5 16.9 5.47
Private Prices (PP)	L0=-3.8 L1=0.96 L2=0.04 L3=5.4 L4=0.42	Constant PP(t-1) Wage Rate Growth(WRGR) Cost of Imported Inputs(CII) Per Capita Consumption(YP/POP)	-3.48 145.11 1.93 7.76 3.32
State Prices (PS)	M0=-0.83 M2=-16.32 M3=-0.00001 M4=0.28	Constant Inflation rate(PGR) Deficit(D) State Wage Rate(SWR)	-0.74 -2.01 -1.80 83.22
Demand for Money (MD)	N0=-5948 N1=0.91 N3=0.02 N4=1588 N5=-50	Constant MD(t-1) Income(Y) Rate of Profit(PROR) Inflation Rate(PGR)	-2.67 44.63 1.59 6.45 -0.49
State Money Supply (MSS)	O0=420 O1=0.98 O2=-20.8 O3=-0.003 O4=114	Constant SMS(t-1) Inflation Rate(PGR) Deficit(D) Growth in Unemployment Rate(URGR)	2.73 56.47 -4.96 -2.27 1.73

Most of the parameter estimates turned out statistically significant and with the appropriate sign. The first six equations constitute the demand side of the economy (coefficients from A to F). Private consumption is well determined by total wages, profits, wealth and the inflation rate. All have the appropriate sign and are statistically significant. The marginal propensity to consume out of wage income is 64%, which is almost twice than the corresponding one of profits of 34%. The long run marginal propensity to consume is 92% for wages and 44% for profits. A ten dollar increase in wealth increases current private consumption by 47 cents in the short-run and 60 cents in the long-run. On the other hand, for reasons explained in chapter six, inflation has a negative impact on private consumption: a 1% increase in the inflation rate decreases private consumption by .21% in the short-run and .27% in the long-run.

State consumption depends very much on national income. Income has a positive effect, which is consistent with the theory developed in chapter six. A one dollar increase in income increases state consumption by 2 cents in the short-run and 3.5 cents in the long-run. However, the three policy goals do not appear to play a very significant role even though they have the predicted sign. The unemployment rate appears to affect state consumption more than the growth of the budget deficit and inflation. A 1% increase in the unemployment rate increases state consumption by 0.54% in the short-run and 0.9% in the long-run. This reflects a Keynesian concern, which advocates demand management policies as a cure of unemployment. The budget deficit and the inflation rate had no significant effect on state

consumption.

Private investment is very well explained by the rate of growth of profit. A one percent increase in profits does not cause much private investment in the short-run (only .06%), but it causes an increase in private investment by .52% in the long-run. This is consistent with the theory of investment, which assumes that there is a time-lag before new investment takes place. On the other hand, capital intensity does not play a significant role and even appears with atheoretically inappropriate sign.

State investment is strongly related to the growth of national wealth. An increase in wealth by 10 dollars increases state investment by 1.32 cents in the short-run and 4.13 cents in the long-run. State investment appears to be negatively related to private investment, which confirms the hypothesis that it has been used as a policy to supplement weak private investment. On the other hand, the unemployment rate appears to have played a statistically significant role, but has a negative sign, which reveals that state investment has not been used as a policy measure to cure unemployment.

Exports and imports respond very well to foreign and national income respectively. Exports increase by 23 million dollars for each billion dollar increase in the United States income. On the other hand, a depreciation in the Canadian dollar (an increase in ER) increases exports three times more than imports. Thus, depreciation appears to be a short-run solution to the balance of trade. In the long-run, it is even better because exports increase four time more than imports. This is consistent with what the J

curve predicts. The price of imports and exports have an expected negative impact but for exports the coefficient is not statistically significant. This is because it is strongly correlated with the exchange rate, which picks up most of the effect on exports. Finally, an increase in Canada's income by one dollar increases imports by 19 cents in the short-run and 61 cents in the long-run.

Equations 7-12 constitute the behavioural equations of the supply side of the Canadian economy. Private labor demand depends positively on profits, exports and the private wage rate. The profit variable is statistically the most significant. If profits increase by one billion dollars (a 5% increase over the average for the entire period), then employment increases by 8,000 in the short-run (a mere .1%), and by 68,000 in the long-run (a .76% increase). Thus, indirect policies aiming at increasing profits as a means of increasing employment may not be very effective. The other statistical significant variable is the private wage rate. During the entire period (1971i-1987ii) the private wage rate averaged a 8.2% increase and private employment reached an average of 8.9 million people. The wage rate has a positive effect on labor demand, which can be explained by the Keynesian argument that an increase in wages increase aggregate demand and therefore employment. Finally, exports play a positive role, but they are not statistically significant.

The most important direct state economic activity on the supply side is state labor demand. All variables are statistically significant. The growth in both the state and the private wage rates appear to play an important role. The effect of the private

wage rate turned out to be positive while the state wage rate had a negative impact. Income plays an important role. An increase in income by one billion dollars (a .3% increase) raises state labor demand by 5,000 or .5%. The income elasticity of state employment is equal to 1.60, which is elastic and confirms the hypothesis that the demand for public goods increases at a rate higher than income. Finally, the most important variable for us is the unemployment rate. It appears that state labor demand is positively related to the unemployment rate. In other words, policy-makers appear to have used state employment as a means to fight unemployment. A one percentage point increase in the unemployment rate raises state employment by 23,270 or by 2.32 percent.

Both production functions (private and capital) exhibit decreasing returns to scale. The difference between the two production functions lies in the income share of capital and labor. The share of labor and capital of the private production function is not surprising. The labor share is three times greater than the share of capital (.67 for labor and .23 for capital). However, in the case of state production function the share of capital is greater than the share of labor. One reason is that state output is relatively more capital intensive than private production. The capital-labor ratio in state production was on average three times the ratio in private production. Finally, a dummy variable in the state production function is very significant, which shows that in the last 18 years the Canadian public sector has undergone drastic changes.

The last two equations of the supply side determine the private and state prices. The private price level is cost-determined. Both the growth in the wage rate and the cost of imported inputs play an important role in determining the private price level. The demand effect, as it is reflected by per capita consumption, had a positive impact on the private price level. The inflation rate has a positive sign in explaining the state price level. State price level grows in the opposite direction as the over-all price level and, thus, it could have been used as a mean of anti-inflationary policy. On the other hand, the deficit has a negative effect. Finally, the state wage rate contributes positively to the state price determination.

The final part of the model is the monetary sector. The two behavioural equations are the demand for money and the state money supply. Wealth and the inflation rate do not play an important role in determining the demand for money. The former appears even with the wrong sign, which is the result of its inter-correlation with income. and therefore was not included. The two key variables in money demand are income and the rate of profit. The latter is the new element in the demand for money, because the rate of profit has not been included in previous studies of the demand for money, at least in the way we have defined it. A one unit increase in the rate of profit (from the average 6.5% to 7.5%) will increase the demand for money by 1600 million in the short-run (1.2% relative to the average). Thus, the rate of profit plays an important role in determining the demand for money.

State money supply for the entire period is better explained by policy concerns alone (income and wealth did not play a significant role and they were dropped out). As it was predicted in chapter eight, state money supply increases when there is an increase in the growth of unemployment rate, a decrease in the deficit, and a decrease in the inflation rate. It appears that the three most important goals of policy-makers for the entire period determined the variation in the state money supply. A ten percent increase in the growth of the unemployment rate increases state money supply by 11.3 million dollars in the short-run (a .1% increase) and by 941 million in the long-run (a 9.3% increase).

Conclusions

In this chapter we presented the specification of the model that was used for estimation purposes. We used the Canadian economic experience of the period of 1971i to 1987i to estimate the theoretical macroeconometric model we presented in the previous chapter. However, a few adjustments have been made to take into account the Canadian economic reality (the exclusion of labor supply) and estimation problems (the autocorrelation in the two production functions). The over-all results of the estimation may be considered as satisfactory in terms of the sign and the statistical significance of most of the variables. In the next chapter we examine the simulation results of the Canadian model and perform some policy experiments.

CHAPTER ELEVEN

SIMULATION AND POLICY ANALYSIS

Introduction

In the previous chapter we presented the structural estimation of the simple model that emphasizes direct state economic activities. In this chapter we present the results of simulation and policy experiments. The emphasis is on five state economic activities: state consumption, state investment, state labor demand, state money supply and state prices. All can be considered as direct state economic activities with the exception of the state money supply.

The first section presents the simulation of the model. The simulated values were used in the final part of this chapter for policy analysis. The main policy experiment was to change permanently each of the five state interventions (consumption, investment, labor demand, money supply and prices) and then trace their effects on the three key policy targets: output, employment and inflation. These are presented in section two.

In the third section we present policy experiments with the three direct state economic activities (consumption, investment and state labor employment) that take into account the government's balanced budget consideration. An increase in the amount spent on one of the direct state economic activity is accompanied by a decrease of equal amount in one of the other two direct state economic activities. These policy experiments show

that government should re-allocate its spending if the main concern are output, employment and inflation. The final section presents the effects of three policy variables: state wage rate, exchange rate and labor supply on output, employment and inflation.

1. Simulation

The simulation of a model can be considered as the reverse of the estimation. The latter uses real data to find values of the unknown parameters of the model. Simulation, on the other hand, uses the estimated parameters and the actual values of the exogenous variables to generate values for the endogenous variables (which may be considered as the unknowns), which are consistent with the mathematical solution of the model. Using the estimated coefficients, the simulation calculates a set of values which can be compared with the actual ones to show how well the model replicates the historical data for the endogenous variables of the model.

The simulated or predicted values are generated for the endogenous variables while the exogenous variables are taken from the actual (historical) data, i.e, they are taken as given. The lagged endogenous are predetermined but their values can be the actual or the simulated values. The latter do not exist for the initial periods, in which case actual data are used. The simulation that uses the actual values for the lagged endogenous is called the 'naive' simulation. This is not the way our model

was simulated. Instead, we used the predicted values to feed the model in terms of its lagged endogenous. In this way, we generated predicted values for the entire period for all endogenous variables. This process is called ex post or historical simulation.(2) The actual data can be compared with the one generated by the simulation process. The smaller the difference between the actual and the simulated, the better the model is capable of generating the actual data.

The difference between the actual and the simulated data cannot be used to compare alternative models or equations within the same model because its level depends very much upon the unit of measurement. If we divide this difference by the actual data for each particular period, we get a unit-free measurement. This ratio then is summed for all values generated by the simulation process after it has been squared so that positive deviations do not cancel out the negative ones. Finally, this sum is divided by the number of periods in the simulation to take the average and then it is square rooted to get rid of the square numbers. The result is a statistic which is called the Root-Mean-Square percent simulation error. It is the most common statistic that is used to evaluate simulation results. The smaller this statistic, the better the simulated data resembles the actual.

Another way to evaluate the simulation results is by Theil's

(2) Alternatively, we could have used ex post forecasting, ex ante forecasting or backcasting but our concern is the specific period under examination. Nevertheless, how well a model forecasts or backcasts can be used as an appropriate index of its relative stability and reliability; see Pindyck and Rubinfeld(1981, pp. 358-360).

inequality coefficient as this is decomposed in its three parts:(3)

UM : Index of Specification Error

UR : Index of Error between Predicted and Actual

UD : Index of Error due to Disturbances

The first index (UM) is the bias which shows whether or not the model has been correctly specified. In other words, it shows how close the average predicted values are to the actual ones. The second index (UR) shows how the oscillations of the predicted (simulated) values resemble the actual. This index can be used to show how well the model captures the turning points of a particular endogenous variable. The last index (UD) refers to the diversion of the actual from the simulated data due to changes in the disturbance. This is less problematic and something that econometricians can do nothing about. In other words, there is no way that a model can exactly match (duplicate) the economic reality. In this case, if $UM=UR=0$ and $UD=1.0$, then these results are the best we can get. However, values of UM less than (.1) or (.2) are considered as satisfactory results.

The following table gives the simulated results for the model using the estimations obtained by seemingly unrelated regressions(SUR). In terms of the Root-Mean-Square percent error, all the equations of the model performed relatively well (below 10%) with the exception of the inflation rate (22.9%). In terms of Theil's measures, most equations had a bias due to

(3) See Pindyck and Rubinfeld(1981, pp. 364-365).

mispecification of less than 15%, with the only exceptions of the inflation rate (31%) and private investment (20%).

Table 11.1 : THEIL'S FORECAST ERROR MEASURES AND STATISTICS OF FIT

VARIABLE	BIAS (UM)	REGRESS (UR)	DISTURB (UD)	RMS % ERROR
Private Consumption(CP)	0.017	0.552	0.431	1.4
State Consumption(CS)	0.002	0.266	0.732	6.0
Private Investment(IP)	0.202	0.494	0.303	9.5
State Investment(IS)	0.044	0.401	0.555	4.3
Exports(E)	0.004	0.486	0.511	4.9
Imports(IMP)	0.124	0.488	0.388	5.3
Private Labor Demand(LDS)	0.014	0.382	0.604	0.9
State Labor Demand(LDS)	0.017	0.398	0.585	4.6
Private Output in logs(YPL)	0.011	0.360	0.629	0.1
State Output in logs(YSL)	0.036	0.859	0.104	0.5
Private Prices(PP)	0.312	0.570	0.118	2.4
State Prices(PS)	0.000	0.616	0.384	1.7
Money Demand(MD)	0.004	0.868	0.128	4.1
State Money Supply(MSS)	0.068	0.885	0.047	4.5
Total Income(Y)	0.094	0.550	0.355	1.7
Private Money Supply(MSP)	0.008	0.868	0.124	4.4
Inflation Rate(PGR)	0.003	0.747	0.250	22.9
Unemployment Rate(UR)	0.031	0.632	0.337	8.3
State Output(YS)	0.029	0.865	0.106	5.4
Private Output(YP)	0.100	0.717	0.183	3.5
Private Wages(WP)	0.014	0.151	0.835	0.9
State Wages(WS)	0.021	0.788	0.191	4.6

2. Structural Analysis

The system of equations we presented to describe direct state involvement can be used to show the relative effectiveness of government policies. The structural analysis involves the estimation and the interpretation of the policy effectiveness as well as the testing of alternative hypotheses. We have already estimated the model in the previous chapter. In this section we provide various ways of interpreting the estimation results by doing some policy experiments. In addition, we try to answer some of the theoretical questions regarding the policy effectiveness in either the short or the long run.

In the model the government can directly affect the economy through its state consumption(CS), state investment(IS), state employment(LDS), state money supply(MSS) and finally through the pricing of state output(PS). Given the structure of the economy we estimated, our concern here is how these five policies affect the three variables which are the targets of policy making: the level of output, employment and the inflation rate. Each direct state economic activity was permanently changed in 1971i and then we traced their relative effect on the three policy variables: output, employment and the inflation rate.(4) State consumption, state investment, state labor demand and state money supply were

(4) It can be argued that, while in the model all state economic activities have been endogenized, when it comes to policy experiments they are treated as exogenous. This is true but one can interpret the changes in these state variables as the result of a change in the response coefficients of various macroeconomic policy concerns. In doing so the calculation of the results of policy experiments becomes easier. Actually, in the policy experiments the constant of each policy variable was changed, which can be interpreted as the autonomous state expenditure.

increased by a hundred million dollars. State prices were decreased by ten units (it is an index). The effect of each alternative policy on the three targets is given in the next three tables (11.2, 11.3, 11.4). We traced the effect of these policy experiments on output, employment and inflation for four years (16 quarters). The first column in each table gives the simulated value of the target variable before the policy change. For each state economic activity (five in total) we give the difference of the simulated value of the target variable after the policy with the pre-policy value (the first column).

A number of important observations can be derived from the results reported in the three tables. What is interesting from a policy-makers point of view is the effect of each particular direct state economic activity. In particular, it is interesting to see which state activity is more effective in its influence on a particular target in the short-run, which is the concern of macroeconomic policy. Let us discuss now the effect of the five policies on each of the three targets.

As it can be seen from the three tables, an increase in state consumption (CS) has a positive effect on all three targets of policy-makers. The multiplier effect of state consumption reaches a maximum of 1.43 in the third quarter. It stabilizes around 1.33. A one dollar increase in state consumption raises output by 1.3 dollars. The effect of a rise in state consumption on inflation is positive, but very small and it becomes close to zero later. In any case, increasing state consumption appears to have little effect on the inflation rate. Finally, state consumption has a positive impact on employment. In the beginning of the four year

period, an increase in state consumption by 100 million dollars increase employment by 9000 jobs.

Table 11.2: POLICY EFFECTS ON OUTPUT (In millions)

YEAR	Initial	CS	IS	LDS	PS
1971	231274	111	111	144	-1706
	230659	140	168	120	-2230
	236461	143	189	110	-2219
	242148	141	215	110	-2205
1972	246582	141	227	122	-951
	247581	135	227	111	-456
	250467	134	232	110	-390
	259836	136	239	117	-393
1973	263098	135	238	116	43
	263011	129	229	110	165
	265614	131	232	110	149
	276387	133	236	116	123
1974	275420	130	231	110	207
	274135	128	228	110	221
	281693	132	235	115	219
	285089	133	237	117	207

Table 11.3: POLICY EFFECTS ON EMPLOYMENT(In 000)

YEAR	Initial	CS	IS	LDS	PS
1971	8006	.43	.43	2.6	-6.72
	8041	.55	.66	2.45	-8.79
	8136	.56	.78	2.4	-8.77
	8219	.55	.85	2.4	-8.74
1972	8271	.56	.90	2.5	-3.77
	8315	.54	.91	2.4	-1.8
	8378	.53	.92	2.4	-1.58
	8464	.55	.96	2.5	-1.7
1973	8573	.54	.95	2.5	0
	8660	.52	.92	2.4	-0.4
	8728	.52	.93	2.4	1
	8869	.54	.95	2.5	1
1974	8976	.52	.93	2.4	0
	9072	.52	.93	2.4	1.47
	9205	.53	.95	2.45	0.88
	9274	.54	.96	2.5	0.84

Table 11.4: POLICY EFFECTS ON INFLATION (in %)

YEAR	Initial	CS	IS	LDS	PS
1971	1.9	.004	.004	.004	2.04
	2.7	.007	.008	.007	5.8
	2.8	.011	.014	.009	6.3
	4.9	.016	.020	.011	6.5
1972	5.7	.016	.023	.01	2.91
	4.9	.015	.023	.009	1.18
	5.8	.013	.023	.009	.625
	6.3	.013	.022	.009	.318
1973	6.3	.011	.022	.008	- .191
	6.1	.01	.020	.007	- .420
	6.1	.01	.019	.007	- .496
	6.1	.009	.017	.006	- .526
1974	6.5	.007	.015	.004	- .553
	7.7	.007	.014	.004	- .563
	10.2	.005	.011	.003	- .579
	10.4	.004	.009	.002	- .579

A permanent increase in state investment (IS) by 100 million dollars had an immediate effect similar to state consumption on the level of output. In the first two quarters output increased by 111 and 168 million dollars respectively, which is the lowest of the entire period under consideration. The state investment multiplier reaches a maximum of 2.38 in the last quarter of the second year. It is important to note here that our distinction between state consumption and state investment has significant implications on the multiplier analysis. The conventional macroeconomic analysis that treats all government expenditures as the same is not adequate for an effective economic policy. A one dollar increase in government expenditures may have different multiplier effects on output depending whether it is spent as current consumption or investment. Using the multiplier results of the model, a one dollar increase in government spending raises output over the four year span by 1.3 dollars if it is spent as state consumption, but it gives one dollar more if it is spent as state investment.

State investment has also a large effect on employment. In the sixteen quarters (four years) of our analysis employment increased by 900 jobs a year. This is second only to state labor employment. The effect of state investment on inflation is similar to that of state consumption but it is larger. In the first period the increase in state investment by 100 million dollars increases the inflation rate by .004%; the effect later becomes larger, but by the end of the period there is a smaller positive effect on inflation.

Another alternative of direct state economic activity policy-makers have is state labor employment. It does not come as a surprise that state labor demand (LDS) is very effective in increasing employment. The state labor demand has the largest effect on employment of any policy. The impact on employment in the first quarter is 2600 jobs and the state labor demand multiplier stabilizes around 2.4 for the entire period. The increase in state labor demand by 100 million dollars has a positive effect on output even though it is small one. For the entire period of three years the multiplier is 1.17, which is much lower than either the state consumption or state investment multiplier. It appears that more employment can be achieved at the cost of lower output. The increase in state labor demand leaves unaffected the inflation rate.

Monetary policy, i.e., a 100 million dollar increase of the state money supply (MSS), had no effect on output (not reported). Thus monetary policy appears unable to have an effect on either output or the unemployment rate. Even inflation is not affected much by state money supply. This is the result of the structure of the model, which makes endogenous the state and private money supply. Thus, a decrease in state money supply may not reduce inflation because there is a corresponding decrease in private money supply.

The increase in state prices by 10 units (close to 15%) has significant effects on all three targets of macroeconomic policy. However, since these effects are mixed effects for each target, the over-all effect is relatively small. The increase in state prices decreases output in the first four quarters but output

increases thereafter. Similar is the effect on employment. It has a large negative effect in the beginning of the period and it turns positive in the fifth quarter. The over-all effect on employment is negative. The same is true for the inflation rate. Thus, it appears that the pricing of state output is a very important policy variable and it can have desirable effects on all policy targets in the very short-run period (eight quarters). The decrease in state prices increases the inflation rate due to the large decrease in output, but the decrease in state prices have a negative effect after the first eight quarters.

Summing up the five policies of direct state economic intervention we can say that state investment has the largest effect on output, state employment on the unemployment rate and state prices on the inflation rate. Monetary policy had small or no effect on all three targets of macroeconomic policy that we examined.

3. Balanced Budget Policies

One of the most important problems of government economic intervention has been the financing of government expenditures. Recently, there has been a big criticism on the way that government has financed its expenditures, particularly the creation of large deficits. In this section we discuss policies that take this into account by comparing the three most important direct state economic intervention: state consumption, state investment and state labor demand.

Suppose that one type of government expenditure increases financed by an equal decrease in another type of government expenditure. It appears that the best policy to increase aggregate output is state investment. An increase in state investment by 100 million dollars at the cost of decreasing state consumption or state labor demand by the same amount will increase output throughout the period. The largest effect is if this increase in state investment is financed by a decrease in state labor demand (an average of 100 million for each single quarter). If it is financed by a decrease in state consumption, then the increase in output is by an average of over 84 million for each single quarter. Finally, output can increase by an average of 18 million dollars if state consumption is increased by 100 million dollars at the cost of state labor demand. Thus, a better re-allocation of government expenditures for direct state economic activities can produce a higher level of output. What is important is not only the aggregate level, but the structure of government expenditures as well.

While state investment appears to be the best instrument in increasing output, this is not the case with the employment target. State labor demand appears to be the most important instrument in achieving higher employment (less unemployment). An increase in state labor demand by 100 million dollars that is accompanied by a simultaneous decrease in either state consumption or state investment results in higher employment. If state investment decreases by the same amount that the labor demand increases, then employment will increase by 1600 jobs a quarter. The same number is 2000 jobs for a re-allocation of government

spending from state consumption to state labor employment.

Finally, balanced budget policies have mixed effects on the inflation rate. The increase in state investment at the cost of either state consumption or state labor demand had a positive effect. An increase in state consumption at the cost of state labor demand had a small positive effect. An increase in state labor demand at the cost of decreasing either state consumption or state investment had a negative effect on inflation.

4. Policy Experiments with Exogenous State Variables

In the small econometric model for policy analysis presented in the previous chapters emphasis was put on direct endogenous state variables. However, these variables do not exhaust the government economic activities that are included in the model. We have selected three important state economic variables that are considered exogenous in the model to analyze their effect on the targets of economic policy. These variables are the state wage rate (WRS), the exchange rate (ER) and the labor supply (LS). These variables can be directly or indirectly controlled by the government sector.(4) The state wage rate and the exchange rate have been the subject of many policy controversies in the last 18 years. The Canadian government has been playing an active role in controlling these variables. The labor supply also has been subject to policy controversies because Canada has committed

(4) We are always referring to the Canadian case.

itself to accepting international labor. For the entire period under consideration (1971i-1987i), Canada has admitted an average of over a 100,000 immigrants a year. Thus, all three variables have been controlled by policy-makers in an attempt to affect such variables as output, employment and the inflation rate. The effects of these variables are discussed in this section.

All three variables were permanently changed for the entire period and we traced their effects on output, employment and the inflation rate for the subsequent 16 quarters (four years). The state wage rate was increased by ten percent, the exchange rate was increased by ten percent (this is equivalent to a depreciation of the Canadian dollar) and finally the labor supply was increased by one hundred thousand. The effects of these changes on output, employment and inflation are given in table 11.5.

Table 11.5: Policy Effects of WRS, ER and LS

YEAR	EFFECTS ON OUTPUT			EFFECTS ON EMPLOYMENT			EFFECTS ON INFLATION		
	WRS	ER	LS	WRS	ER	LS	WRS	ER	LS
1971	-1479	1742	1594	-18.94	8.1	26.13	1.00	.0053	.0041
	-1513	2967	1247	-19.69	14.64	24.82	1.6	.0129	.0069
	-1434	3662	1068	-19.26	20.32	23.89	1.8	.0243	.0089
	-1566	4251	1071	-20.45	25.48	23.72	2.0	.0362	.0112
1972	-1330	4700	1226	-20.00	30.12	24.34	1.1	.0434	.0097
	-1060	4912	1049	-18.33	34.15	23.66	0.6	.0490	.0086
	-1079	5152	1038	-19.15	37.49	23.32	0.4	.0497	.0082
	-1268	5441	1183	-21.17	41.23	23.84	0.25	.05	.0082
1973	-1093	5546	1126	-20.17	44.1	23.36	0.093	.0491	.0071
	-848	5522	876	-19.14	46.31	22.09	0.037	.0481	.0061
	-914	5655	943	-19.77	48.81	22.55	0.003	.0464	.0054
	-1055	5812	1015	-21.15	51.41	22.61	-0.013	.0445	.0045
1974	-915	5750	1270	-20.96	52.87	21.88	-0.01	.0407	.0032
	-843	5696	794	-20.99	54.11	21.47	-0.025	.0366	.0028
	-1078	5838	911	-23.68	56.04	21.97	0.007	.0310	.0023
	-1161	5914	942	-24.66	57.56	21.9	0.006	.0280	.0014

The State Wage Rate (WRS) was increased by 10%

The Exchange Rate (ER) was depreciated by 10%

Labor Supply (LS) was increased by 100,000

The increase in the state wage rate by ten percent has mixed effects on all three targets of economic policy. Output decreases by an average of 1.5 billion dollars in the first four periods (a decrease by .67%), but it stabilizes to around 1 billion in the subsequent quarters. Similar to the effect on output is the effect on employment. The effect is negative, a loss of 10,000 jobs per quarter. The increase in the state wage rate has an initial large positive effect on the inflation rate, but declines thereafter until it becomes almost zero. It appears therefore that the increase in the state wage rate can decrease output and employment and increase the inflation rate in the short-run.

The depreciation of the Canadian dollar by ten percent for the entire period has a strong positive effect on output. In the four

year period output increases by close to five billion dollars which might justify policy-makers pre-occupation with a strong dollar. Similar to the output effect, depreciation increases employment. The ten percent depreciation generates an average of 38,000 jobs a year for the four year period under consideration. Depreciation increases inflation but the effect is relatively small.

The last policy is that of increasing labor supply. The increase in the labor supply by one hundred thousands has a positive effect on output. In the first four quarters output increases by 12 billion dollars a period. In the next two years output is constantly increasing, but at a decreasing rate. The over-all effect is positive, output increases on average by 1 billion dollars. Similar to the output is the effect on employment. The increase in labor supply increase employment, but by not very much. The average increase in employment is 25,000 jobs. On the other hand, the positive effect on inflation is not very strong. It can be concluded that an increase in the labor supply increases output but has small effects on employment and inflation.

Conclusions

The main findings of this chapter regarding the revealed goals policy-makers and the effectiveness of state economic activities are:

- (i) State investment is the most important direct state economic activity that can be used to achieve lower unemployment and raise

output.

(ii) State labor employment is very effective in decreasing the unemployment rate (the best policy) and increasing the output but it is not as effective as state investment and consumption. It appears that it crowds out private production by less than it increases state output. Thus, the over-all effect on output is positive but a small one.

(iii) The pricing of state output has not been used to reduce the over-all inflation rate, which would appear as the most appropriate policy. As the policy experiments have shown, the state price level had a large effect on the inflation rate.

(iv) State consumption had similar effects as those of state investment but were not as large.

(v) State money supply had no real effects, which can be the result of the role of the private money supply. The latter plays an important endogenous role in the monetary sector.

(vi) Using balanced budget policies, state investment appears to be the best policy in promoting more economic activity.

(vii) An increase in the state wage rate decreases output and employment and increases inflation.

(viii) A depreciation of the Canadian dollar has strong negative effects on output and employment.

(ix) An increase in the labor supply increases output and employment, but the effects are not very large.

GENERAL CONCLUSIONS

Both the theoretical and empirical analysis of this study suggest that state economic intervention should be re-organized to respond to the different types of economic crises. Government intervention does have real effects if the 'right' policies are undertaken at any period of time. Fixed policy rules should never be applied because optimal policies change as the economic situation changes.

The conclusion reached in this study on policy effectiveness was the result of a new distinction of macroeconomic policies. In the theoretical and empirical framework presented in the first and the second part, respectively, the state is modelled to play a direct economic role in both the demand and the supply side of the economy. In other words, the state not only consumes final goods and services but it produces final goods and services as well. It is this double economic feature of state intervention that permits economic policy to be effective even in cases in which conventional demand management policies do not work.

There are many ways that government intervention can be effective. Thus, the argument in support of non-government intervention at the macroeconomic level may not be appropriate if only demand management policies are considered. It was shown that it is quite possible that government intervention is ineffective when it applies demand management policies, but it can be effective if supply management policies are implemented.

The emphasis of this study was on direct supply management policies such as state production and state labor demand. It was argued that these type of policies can be used as an alternative to demand management policies, particularly when the economy experiences symptoms of stagflation. However, there is a qualitative difference between direct demand and supply management policies. The latter solves economic problems by restricting the relative share of private production. In other words, it implies important structural changes from a private economy to a 'social' economy.

Another important distinction made in this study is between direct and indirect government economic intervention. For example, on the supply side government can intervene by either producing the goods (a direct policy) or by implementing policies that support the production of goods and services by the private sector. The latter are indirect policies and may include cuts in corporations' income tax, minimum wage policies, capital subsidies, etc. Similarly, on the demand side indirect policies can be implemented to affect the consumption behaviour of the private sector. It was concluded that the effectiveness of indirect policies depends very much on people's reaction to government policies. In any case, indirect policies can be as effective as the direct policies, but it is quite possible they are inferior.

The empirical evidence does not reject the hypothesis that systematic direct government intervention on the supply side of the economy can have real effects. Furthermore, depending on the goals of policy-makers, these types of policies can be more

effective than demand management policies. Thus, it was concluded that how government expenditures are allocated makes a lot of a difference to the effectiveness of state economic intervention. Bad economic policy should not imply no state economic intervention. It should imply a more systematic state intervention. It should imply a state intervention based on the key macroeconomic objectives, such as full employment, economic growth and price stability. Depending upon the macroeconomic situation and the relative weights of the policy objectives, more and/or less state intervention may be necessary for each of the four possible types of state intervention: direct supply management, indirect supply management, direct demand management and indirect demand management policies.

REFERENCES

Abel, A.B. and O.J. Blanchard, 'The Present Value of Profits and Cyclical Movements in Investment', Econometrica, 1986, pp. 249-273.

Adam, J., (ed.), Employment Policies in the Soviet Union and Eastern Europe, New York: St. Martin Press, 1982.

Akhard, H., and R. Milbourne, 'Credit Cards and the Transactions Demand for Money', mimeo, Discussion Paper 549, Institute for Economic Research, Queens University, February 1984.

Alt, J.E. and K.A. Chrystal, Political Economics, Berkley: University of California Press, 1983.

Amsdem, H.A., 'An International Comparison of the Rate of Surplus Value in Manufacturing Industry', Cambridge Journal of Economics, vol. 5, 1981, pp. 229-49.

Arestis, P., and C. Driver, 'U.K. Unemployment and Post-Keynesian Remedies', Metroeconomica, 35, 1983, pp. 275-291

Aschheim, J. and G.S. Tavlas, 'The Simultaneity Problem in Forecasting Inflation', Atlantic Economic Journal, 1984, pp. 20-29.

Asimakopulos, A., 'A Kaleckian Profits Equation and the United States Economy, 1950-82', Metroeconomica, 35, 1983, pp. 1-27.

Atkinson, A.B., The Economics of Inequality, 2nd Edition, Oxford: Clarendon Press, 1983.

Azariadis, C., 'Implicit Contracts and Underemployment Equilibrium', Journal of Political Economy, vol. 83 no. 6, Dec. 1975, pp. 1183-1202.

Baily, M.N., 'Wages and Employment under Uncertain Demand', Review of Economic Studies, vol. 41, 1974, pp. 37-50.

Baily, M.N. and J. Tobin, ''Macroeconomic Effects of Selective Public Employment and Wage Subsidies'', Brookings Papers of Economic Activity, 1977, pp. 511-541.

Barro, R.J., ''Are Government Bonds Net Wealth?'', Journal of Political Economy, 1974, pp. 1095-1117.

Barro, R.J., ''Rational Expectations and the Role of Monetary Policy'', Journal of Monetary Economics, 1976, pp. 1-32.

Barro, R.J., Macroeconomics, New York: John Wiley and Sons, 1986 (first edition in 1984).

Barro, R.J., and D.B. Gordon, ''A Positive Theory of Monetary Policy in a Natural Rate Model'', Journal of Political Economy, 91, 1983, pp. 589-610.

Barro, R.J., and H.I. Grossman, ''A General Disequilibrium Model of Income and Employment'', American Economic Review, 61, 1971, pp. 82-93.

Barsky, R.B., N.G. Mankiw, and S.P. Zeldes, ''Ricardian Consumers With Keynesian Propensities'', American Economic Review, 1986, pp. 676-691.

Baumol, W.J., ''The Transactions Demand for Cash: An Inventory Theoretic Approach'', Quarterly Journal of Economics, Nov. 1952, pp. 545-556.

Baumol, W.J., ''Macro-Economics of Unbalanced Growth'', American Economic Review, 1967, pp. 415-426.

Baumol, W.J., (ed.), Public and Private Enterprise in a Mixed Economy, London: Macmillan Press, 1980.

Baumol, W.J., ''Toward a Theory of Public Enterprise'', Atlantic Economic Journal, 12, 1984, pp. 13-19.

Binks, M., and J. Coyne, The Birth of Enterprise, London: The Institute of Economic Affairs, 1983.

Bird, R.M., Financing Canadian Government: A Quantitative Overview, Canadian Tax Foundation, 1979.

Bird, R.M., and D.K. Foot, 'Bureaucratic Growth in Canada: Myths and Realities', Chapter 8 in G.B. Dern and A.M. Maslove(ed.), The Public Evaluation of Government Spending, Toronto: Institute for Research in Public Policy, 1979, pp. 121-148.

Blaug, M., A Methodological Appraisal of Marxian Economics, Amsterdam: North-Holland, 1980.

Blinder, A.S., 'Keynes, Lucas and Scientific Progress', American Economic Review, Paper and Proceedings, 1987, pp. 130-136.

Blinder, A.S., and R.M. Solow, 'Does Fiscal Policy Matter?' Journal of Public Economics, 2, 1973, pp. 319-337.

Bodkin, R.G., 'Real Wages and Cyclical Variations in Employment', Canadian Journal of Economics, 2, 1969, pp. 353-374.

Bodkin, R.G., 'Additively Consistent Relationships for Personal Savings and the Categories of Consumption Expenditures, U.S.A., 1949-1963', Eastern Economic Journal, 1974, pp. 20-51.

Bodkin, R.G., 'The Challenge of Inflation and Unemployment in Canada during the 1980s: Would a Tax-Based Incomes Policy Help?', Canadian Public Policy, supplement, 7, 1981, pp. 204-214.

Bodkin, R.G., and L.R. Klein, 'Macro-econometric Modelling: A Schematic History and a View of its Possible Future', mimeo, Research Paper No. 8109, Dept. of Economics, Faculty of Social Sciences, University of Ottawa, May 1981.

Bodkin, R.G., L.R. Klein, and K. Marwah, A History of Macroeconometric Model-Building, manuscript.

Boskin, M.J., M.S. Robinson, T. O'Reilly and P. Kumer, 'New Estimates of the Value of Federal Mineral Rights and

Land'', American Economic Review, 75, 1985, pp. 923-936.

Bowles, S., ''The Production Process in a Competitive Economy: Walrasian Neo-Hobbesian and Marxian Models'', American Economic Review, 1985, pp. 16-36.

Brainard, W., ''Uncertainty and the Effectiveness of Policy'', American Economic Review, Papers and Proceedings, May 1967, pp. 411-425.

Branson, W.H., Macroeconomic Theory and Policy, 2nd Edition, New York: Harper and Row Publishers, 1979.

Branson, W.H., and A.K. Klevorick, ''Money Illusion and the Aggregate Consumption Function'', American Economic Review, 1968, pp. 832-849.

Brown, T.M., ''Habit Persistence and Lags in Consumer Behaviour'', Econometrica, 1952, pp. 355-371.

Brunhoff, de S., Marx on Money, New York: Vriizen Books, 1976.

Brunhoff, de S., The State, Capital and Economic Policy, Great Britain: Pluto Press, 1978.

Brunner, K. and A.H. Meltzer, ''The Uses of Money: Money in the Theory of an Exchange Economy'', American Economic Review, Dec. 1971, pp. 784-805.

Brunner, K. and A.H. Meltzer, ''Friedman's Monetary Theory'', Journal of Political Economy, 80, 1972, pp. 837-851.

Bruno, M., and J. Sachs, Economics of Worldwide Stagflation, Cambridge, MA: Harvard University Press, 1985.

Caves, D.W., and L.R. Christensen, ''The Relative Efficiency of Public and Private Firms in a Competitive Environment: The Case of Canadian Railroads'', Journal of Political Economy, 1980, pp. 958-976.

Christensen, S., Unions and The Public Interest, Collective Bargaining in the Public Sector, Canada: The Fraser Institute, 1980.

Christiansen, J., 'Marx and the Falling Rate of Profit', American Economic Review, 1976, pp. 20-26.

Clower, R.W., 'The Keynesian Counter-Revolution: A Theoretical Appraisal', in The Theory of Interest Rates, edited by F.H. Hahn and F. Brechling (1965), reprinted in Modern Macroeconomics, edited by P.G. Korliras and R.S. Thorn, New York: Harper and Row Publishers, 1979, pp. 289-304.

Cornwall, J., 'Macrodynamics' in A.S. Eichner(ed.), A Guide to Post-Keynesian Economics, New York: M.E. Sharpe, Inc., 1979, pp. 19-33.

Cornwall, J., 'Unemployment and Inflation: Institutional and Structuralist Views, A Review Article', Journal of Economic Issues, Vol. XV, No. 1, March 1981, pp. 113-27.

Cox, M.W., 'Unanticipated Money, Output, and Prices in the Small Economy', Journal of Monetary Economics, 1980, pp. 359-399.

Deaton, A.S., 'Involuntary Savings Through Unanticipated Inflation', American Economic Review, 67, 1977, pp. 899-910

Desai, M., Applied Econometrics, Oxford: Philip Allan Publishers, 1976.

Desai, M., Marxian Economics, New Jersey: Littlefield Adams and Co., 1979.

Domar, E.D., Essays in the Theory of Economic Growth, New York: Oxford University Press, 1957

Dornbusch, R., S. Fischer, and G.S. Sparks, Macroeconomics, 2nd Canadian Edition, Toronto: McGraw-Hill, 1985.

Duda, H., and E. Fehr, "Power, Efficiency and Profitability: A Radical Theory of the Firm", Economic Analysis and Workers' Management, 1987, pp. 1-26.

Duessenberry, J.S., "The Portfolio Approach to the Demand for Money and Other Aspects" Review of Economics and Statistics, Aug. 1963, pp. 9-31.

Eatwell, J., Whatever Happened to Britain, London: Duckworth, British Broadcasting Corporation, 1982.

Eckstein, O., The DRI Model of the U.S. Economy, New York: McGraw-Hill, 1983.

Eckstein, O., and G. Fromm, "The Price Equation", American Economic Review, 58, 1968,

Eichner, A.S.(ed), A Guide to Post-Keynesian Economics, New York: M.E. Sharpe, Inc., 1979.

Eichner, A.S. and J.A. Kregel, "An Essay on Post-Keynesian Theory: A New Paradigm in Economics", Journal of Economic Literature, 1975, pp. 1293-1314.

Erdos, P., Wages, Profits, Taxation Budapest: Akademiai Kiado, 1982

Fazzari, S., and H. Minsky, "Domestic Monetary Policy: If not Monetarism What?", Journal of Economic Issues, vol. XVIII, No. 1, March 1984, pp. 101-116.

Feldman, G.A., "On the Theory of Growth Rates of National Income I-II" in Foundations of Soviet Strategy for Economic Growth: Selected Soviet Essays 1924-1930, edited by N. Spulber, Bloomington: 1964, pp. 174-199, and 304-331.

Feldstein, M., and L. Summers, "Is the Rate of Profit Falling?", Brookings Paper of Economic Activity, 1977, pp. 211-227.

Ferber, R., "Consumer Economics: A Survey" Journal of Economic Literature, 11, 1973, pp. 1303-1342.

Fischer, S., 'Long-term Contracts, Rational Expectations, and the Optimal Money Supply Rule', Journal of Political Economy, vol. 85, no. 1, 1977, pp. 191-205.

Fisher, I., 'A Statistical Relation Between Unemployment and Price Changes', International Labour Review, 13, No. 6, June 1926, pp. 785-92.

Fleming, J.M., 'Targets and Instruments', IMF Staff Papers, 15, 1968, pp. 387-402.

Flood, R.P., 'Capital Mobility and the Choice of Exchange Rate System', International Economic Review, 20, 1979, pp. 405-416.

Fox, K.A., J.K. Sengupta, and E. Thorbecke, The Theory of Quantitative Economic Policy with Applications to Economic Growth, Stabilization and Planning, 2nd Edition, Amsterdam: North Holland, 1973.

Frank, R.H., 'Are Workers Paid their Marginal Product?', American Economic Review, 74, 1984, pp. 549-571.

Freeman, R.B., 'Unionism Comes to the Public Sector', Journal of Economic Literature, 1986, pp. 41-86.

Frey, B.S., Democratic Economic Policy: A Theoretical Introduction, Oxford: Martin Robertson, 1983.

Frey, B.S., W.W. Pommerehne and F. Schneider, 'Are We All Monetarists Now? An Empirical Inquiry', Journal of Post Keynesian Economics, 6, 1983, pp. 89-96.

Friedman, B.M., 'Targets, Instruments, and Indicators of Monetary Policy', Journal of Monetary Economics, 1, 1975, pp. 443-473.

Friedman, B.M., 'Crowding Out or Crowding In? Economic Consequences of Financing Government Deficits', Brookings Paper of Economic Activity, 3, 1978, pp. 593-641.

Friedman, M., A Theory of the Consumption Function, Princeton: National Bureau of Economic Research, 1957.

Friedman, M., Capitalism and Freedom, Chicago: University of Chicago Press, 1962.

Friedman, M., 'The Role of Monetary Policy', American Economic Review 58, 1968, pp. 1-17.

Friedman, M., 'A Theoretical Framework for Monetary Analysis', Journal of Political Economy, 78, 1970, pp. 193-238.

Friedman, M., 'A Monetary Theory of Nominal Income', Journal of Political Economy, 79, 1971, pp. 323-337.

Friedman, M., 'Comments on the Critics', Journal of Political Economy, 80, 1972, pp. 906-950.

Friedman, M. and R. Friedman, Free to Choose, New York: Harcourt Brace Jovanovitch, 1980.

Friedman, M. and D. Meiselman, 'The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States', Commission on Money and Credit, Stabilization Policies, New Jersey: Prencice-Hall, 1963.

Friedman, M. and A.J. Schwartz, A Monetary History of the United States 1867-1960, New Jersey: Princeton University Press, 1963.

Friedman, M. and A.J. Schwartz, 'Has Government any Role in Money?', Journal of Monetary Economics, 1986, pp. 37-62.

Frisch, H., 'Inflation Theory 1963-1975: A 'Second Generation' Survey', Journal of Economic Literature, 15, 1977, pp. 1289-1317.

Frisch, H., Theories of Inflation, Cambridge: Cambridge University Press, 1983.

Galbraith, J.K., Money: Whence it Came, Where it Went, Boston: Houghton Mifflin Company Boston, 1975.

Galbraith, J.K., The Anatomy of Power, Boston: Houghton Mifflin Company Boston, 1983.

Goldfeld, S.M., 'The Demand for Money Revisited', Brooking Paper of Economic Activity, no. 3, 1973, pp. 576-638.

Goldfeld, S.M. and R.E. Quandt, Nonlinear Methods in Econometrics, Amsterdam: North-Holland, 1972.

Gottlieb, R.S., 'Feudalism and Historical Materialism: A Critique and a Synthesis', Science and Society, 1984, p. 1-37.

Gray, J.A., 'On Indexation and Contract Length', Journal of Political Economy, 86, 1978, pp. 1-18.

Gray, J.A. 'Wage Indexation: A Macroeconomic Approach' Journal of Monetary Economics, vol. 2 no. 2, April 1976, pp. 221-235.

Gylfanson, T., and A. Lindbeck, 'Endogenous Unions and Governments: A Game Theoretical Approach', European Economic Review, 1986, pp. 5-26.

Hall, R.E., and J.B. Taylor, Macroeconomics: Theory, Performance and Policy, New York: W.W. Norton, 1986.

Hayek, F.A., The Road to Serfdom, Chicago: University of Chicago Press, 1944.

Hicks, J.R., 'Mr. Keynes and the 'Classics'; A Suggested Interpretation', Econometrica, 5, 1937, pp. 147-159.

Hilferding, R., Finance Capital: A Study of the Latest Phase of Capitalist Development, (Originally in German: 1910), London: Routledge & Kegan Paul, 1981.

Holbrook, R., and H. Shapiro, 'The Choice of Optimal Intermediate Economic Targets', American Economic Review, Papers and Proceedings, May 1970, pp. 40-46.

Howitt. P., ''The Keynesian Recovery'', Canadian Journal of Economics, 1986, pp. 626-641.

Hunt, C.K., and H.J. Sherman, Economics: An Introduction to Traditional and Radical Views, New York: Harper and Row Publishers, 4th Edition, 1981.

Hunt, I., ''An Obituary or a New Life for the Tendency of the Rate to Profit to Fall?'', Review of Radical Political Economy, pp. 131-148, 1983.

Hutchison, T.W., Keynes v. the 'Keynesians', London: The Institute of Economic Affairs, 1977.

Intriligator, M.D., Econometric Models, Techniques, and Applications, New Jersey: Prentice-Hall, 1978.

Jorgenson, D.W., ''Econometric Studies of Investment Behavior: A Survey'', Journal of Economic Literature, 9, 1971, pp. 1111-1147.

Just, R.E., D.L. Hueth, and A. Schmitz, Applied Welfare Economics and Public Policy, New Jersey: Prentice-Hall Inc., 1982.

Kaldor, N., ''Alternative Theories of Distribution'', Review of Economic Studies, 23, 1956, pp. 83-100.

Kaldor, N., The Economic Consequences of Mrs Thatcher, Great Britain: Duckworth, 1983.

Kalecki, M., ''Political Aspects of Full Employment'', Political Quarterly, 14, 1943, pp. 322-330.

Kalecki, M., Studies in the Theory of Business Cycle, 1933-1939, New York: Kelley, 1966.

Kalecki, M., ''Three Ways to Full Employment'', The Economics of Full Employment, First Edition 1944, New York: A.M. Kelley Publishers, 1967, pp. 39-58.

Keynes, J.M., Economic Consequences of the Peace, New York: Harcourt, Brace and Howe, 1920.

Keynes, J.M., The General Theory of Employment, Interest and Money. New York: Harcourt, Brace and Howe, 1936.

Keynes, J.M., 'How to Avoid a Slump?' The Times, 12, 13, and 14 of January 1937. Reprinted in T.W. Hutchison, Keynes vs. the 'Keynesians'...? London: Institute of Economic Affairs, 1977.

Killingsworth, M.R., Labour Supply, London: Cambridge University Press, 1983

Klamer, A., Conversations with Economists, New Jersey: Rowman and Allanheld Publishers, 1983.

Klein, L.R., The Keynesian Revolution, New York: The Macmillan Company, (first edition: 1947), 1961.

Klein, L.R., Lectures in Econometrics, Amsterdam: North-Holland, 1983.

Klein, L.R., and A.S. Goldberger, An Econometric Model of the United States, 1929-1952, Amsterdam: North-Holland, 1955.

Koepp, S., 'Public Service, Private Profits', Time, February 10, 1986, pp. 66-68.

Kooten, van G.C., and A. Schmitz, 'Commodity Price Stabilization: The Price Uncertainty Case', Journal of Canadian Economics, 18, 1985, pp. 426-434.

Korliras, P.G., and R.S. Thorn (edition), Modern Macroeconomics: Major Contributions to Contemporary Thought, New York: Harper and Row Publishers, 1979.

Koskela, E., and M. Viren, 'Anticipated Versus 'Suprise' Inflation in Household Consumption Behaviour' Economic Letters, 17, 1985, pp. 77-81.

Krueger, A.O., Exchange Rate Determination, Cambridge: Cambridge University Press, 1983.

Kuh, E., 'Measurement of Potential Output', American Economic Review, Sept. 1966, pp. 758-776.

Kydland, F.E., and E.C. Prescott, 'Time to Build and Aggregate Fluctuations', Econometrica, 1983, pp. 1345-1370.

Laidler, D., 'Some Evidence on the Demand for Money', Journal of Political Economy, vol. 74 no. 1, Feb. 1966, pp. 55-68.

Laidler, D., The Demand for Money: Theories and Evidence, 3rd Edition, New York: Dun-Donnelley Publishing Corp., 1986.

Laidler, D., 'Monetarism: An Interpretation and an Assessment', The Economic Journal, 1981, pp. 1-28.

Laumas, G.S., and R. Ram, 'Human and Nonhuman Wealth in Demand for Money Functions', Journal of Political Economy, vol. 88, no. 1, Feb. 1980, pp. 186-193.

Layard, R., 'Is Incomes Policy the Answer to Unemployment?', Economica, 1982, pp. 219-239.

Lenin, V.I., Imperialism, the Highest State of Capitalism First Published in 1916, Peking: Foreign Languages Press, 1973.

Leroy, S.F., and D.E. Lindsey, 'Determining the Monetary Instrument: A Diagrammatic Exposition', American Economic Review, 68, 1978, pp. 929-934.

Lianos, T.P., 'A Graphical Exposition of a Post Keynesian Model', Journal of Post Keynesian Economics, 1983-84, pp. 313-323.

Lipsey, R.G., 'The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1862-1957: A Further Analysis', Economica, 1960, pp. 1-31.

Lipsey, R.G., ''Structural and Dificient-Demand Unemployment Reconsidered'', in Employment Policy and the Labour Market, Edited by Arthur M. Ross, Berkeley: University of California Press, 1965,

Long, J.B., and C.I. Plosser, ''Real Business Cycle'', Journal of Political Economy, 1983, pp. 39-69.

Long, J.B., and L.H. Summers, ''Is increased Price Flexibility Stabilizing?'', American Economic Review, 1986, pp. 1031-1044.

Loranger, J.G., ''Some Pitfalls of Thinking About the Law of the Falling Tendency of the Rate of Profit'', mimeo, 8409, Universite de Montreal.

Lucas, R.E. Jr., ''Real Wages, Employment and Inflation'', Journal of Political Economy, 1969, pp. 721-754.

Lucas, R.E. Jr., ''Econometric Testing of the Natural Rate Hypothesis'' in Eckstein eds The Econometrics of Price Determination Conference, Washington: Board of Governors of the Federal Reserve System, 1970, pp. 50-59.

Lucas, R.E. Jr., ''Expectations and the Neutrality of Money'', Journal of Economic Theory, 1972, pp. 103-124.

Lucas, R.E. Jr., ''Some International Evidence on Output-Inflation Trade-offs'', American Economic Review, 1973, pp.

Lucas, R.E. Jr., ''Econometric Policy Evaluation: A Critique'' in K. Brunner and A.H. Meltzer(eds.), The Phillips Curve and Labor Markets, Vol. 1 of Carnegie-Rochester Conference Series on Public Policy, Amsterdam: North-Holland, 1975, pp. 19-46.

Lucas, R.E. Jr., ''Unemployment Policy'', American Economic Review Papers and Proceedings, 1978, pp. 353-357.

Lucas, R.E. Jr., ''Tobin and Monetarism: A Review Article'', Journal of Economic Literature, 1981, pp. 558-567.

Lucas, R.E. Jr., Studies in Business Cycle Theory, Cambridge, MA: MIT Press, 1983.

Lucas, R.E. Jr., 'Principles of Fiscal and Monetary Policy', Journal of Monetary Economics, 1986, pp. 117-134.

Lucas, R.E., Jr., and T.J. Sargent, 'After Keynesian Macroeconomics', in After the Phillips Curve: Persistence of High Inflation and High Unemployment, Federal Reserve Bank Of Boston, Conference Series No. 19, 1977. Reprinted in Lucas(1983).

McCallum, B.T., and Whittaker, 'The Effectiveness of Fiscal Feedback Rules and Automatic Stabilizers under Rational Expectations', Journal of Monetary Economics, 1979, pp.171-186.

Machlup, F., 'Theories of the Firm: Marginalism, Behavioral, Managerial', American Economic Review, 1967, pp. 1-33.

McMillin, W.D., and J.S. Fackler, 'Monetary Aggregates: An Evaluation of Monetary Policy Targets', Southern Economic Journal, 50, 1984, pp. 711-723.

McNees, S.K., 'Estimating GNP: The Trade-Off between Timeliness and Accuracy', New England Economic Review, Jan/Feb 1986, pp. 3-10.

Maddock, R., 'Rational Expectations Macrotheory: a Lakatosian Case Study in Program Adjustment', History of Political Economy, 16, 1984, pp. 291-309.

Malinvaud, E., The Theory of Unemployment Reconsidered, Oxford: Basil Blackwell, 1977(reprinted1978).

Marshall, R., 'Selective Employment Programs and Economic Policy', Journal of Economic Issues, Vol. XVII, No. 1, March 1984, pp. 117-142.

Marx, K., Critique of the Gotha Programme, Moscow: Progress Publishers, 1971. (originally published in 1937, written in 1875).

Marx, K., Wage Labour and Capital, Moscow: Progress Publishers, 1974 (Originally published in 1891).

Marx, K., Capital I, II, III, Moscow: Progress Publishers, 1954 (Originally published in 1867, 1885, and 1894 respectively).

Massell, B.F., ''Price Stabilization and Welfare'', Quarterly Journal of Economics, 83, 1969, pp. 284-298.

Mauder, P., (eds.) Government Intervention in the Developed Economy, London: Croom Helm, 1979.

Mayes, D.G., Applications of Econometrics, London: Prentice-Hall International, 1981.

Meltzer, A.H., ''The Demand for Money: The Evidence from the Time Series'', Journal of Political Economy, vol. 71, no. 3, June 1963, pp. 219-246.

Meyer, J., and E. Kuh, The Investment Decision, Cambridge: Harvard University Press, 1957.

Miliband, R., The State in Capitalist Society, London: Weidenfeld and Nicolson, 1969.

Miliband, P., ''State Power and Class Interests'', New Left Review, no 138, 1983.

Miliband, R., ''State Power and Capitalist Democracy'', mimeo, 1986.

Minarik, J., ''Who Wins, Who Loses from Inflation?'', Brookings Bulletin, Summer 1978.

Minsky, H.P., ''The Legacy of Keynes'', Metroeconomica, 35, 1983, pp. 87-103.

Mitnick, B.M., The Political Economy of Regulation, New York: Columbia University Press, 1980.

Modigliani, F., 'Liquidity Preference and the Theory of Interest and Money', Econometrica, 1944, pp. 45-88.

Modigliani, F., 'The Monetarist Controversy or Should we Forsake Stabilization Policies?', American Economic Review, 1977, pp. 1-19.

Moore, B.J., 'Monetary Factors', in A.S. Eichner(eds), A Guide to Post Keynesian Economics, New York: M.E. Sharpe, Inc., 1979.

Mosley, P. and R. Cracknell, 'Endogenous Government Policy in a Model of the UK Economy', Applied Economics, 16, 1984, pp. 633-645.

Mueller, D.C., and P. Murrell, 'Interest Groups and the Political Economy of Government Size', in F. Forte and A. Peacock (edition), Public Expenditures and Government Growth, Oxford: Basil Blackwell, 1985, ch. 1, pp. 13-36.

Neal, F., and R. Shone, Economic Model Building, London:Macmillan Press, 1976

Nell, E., 'The Simple Theory of Effective Demand', Intermountain Economic Review, 1978, pp. 1-32.

Ng, Y.K., Welfare Economics: Introduction and Development of Basic Concepts, Hong Kong: The Macmillan Press Ltd, Revised Edition, 1983.

Niehans, The Theory of Money, Baltimore, Maryland: The John Hopkins University Press, 1978.

Nordhaus, W.D., 'Recent Developments in Price Dynamics', in O. Eckstein(ed.) The Econometrics of Price Determination, Washington: Federal Reserve Board, 1971, pp. 16-49

Nordhaus, W.D., 'The Falling Share of Profits', Brooking Papers of Economic Activity, 1974, pp. 169-208.

Norton, R.D., 'Industrial Policy and American Renewal', Journal of Economic Literature, 1986, pp. 1-40.

Nove, A., 'What Will Gorbachev Do?', London, Ontario: The Centre for the Study of International Economic Relations, Mimeo, 1985.

O'Connor, J., The Fiscal Crisis of the State, New York: St. Martin Press, 1973.

Oi, W.Y., 'The Desirability of Price Instability Under Perfect Competition', Econometrica, 29, 1961, pp. 58-64.

Ostroy, J.M., 'The Informational Efficiency of Monetary Exchange', American Economic Review, Sept. 1973, pp. 597-610.

Ostroy, J.M., and R.M. Starr, 'Money and the Decentralization of Exchange', Econometrica, 1974, pp. 1093-1113.

Parkin, M., and R. Bade, Modern Macroeconomics, 2nd Edition, 1986

Parsley, C.J., 'Labour Union Effects on Wage Gains: A Survey of Recent Literature', Journal of Economic Literature, 18, 1980, pp. 1-31.

Patinkin, D., Money, Interest, and Prices: An Integration of Monetary and Value theory, 2nd Edition, New York: Harper and Row, 1965(First Edition 1956).

Peacock, A., and J. Wiseman, The Growth of Public Expenditure in the United Kingdom, Princeton: Princeton University Press, 1961.

Peston, M.H., 'The Elementary Macroeconomic Consequences of differing Public and Private Sector Wages', Public Finance, 1986, pp. 173-181.

Peterson, W.C., 'Economic Stabilization and Inflation', Journal of Economic Issues, Vol. XVIII, No. 1, March 1984, pp. 69-100.

Phelps, E.S. and J.B. Taylor, 'Stabilization Properties of Monetary Policy Under Rational Expectations', Journal of

Political Economy, 1977, pp. 163-190.

Phillips, A.W., 'The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957', Economica, 1958, pp. 283-299.

Phlips, L., Applied Consumption Analysis, Amsterdam: North Holland, 1983.

Pindyck, R.S. and D. Rubinfeld, Econometric Models and Economic Forecasts, 2nd Edition, New York: McGraw-Hill, 1981.

Poole, W., 'Optimal Choice of Monetary Policy Instruments in a Simple Stochastic Macro Model', Quarterly Journal of Economics, 1970, pp. 197-216

Poulantzas, N., 'The Problem of the Capitalist State', New Left Review, Winter 1969, pp. 67-78.

Poulantzas, N., Political Power and Social Classes, London: New Left Books, 1973.

Poulantzas, N., 'On Social Classes', New Left Review, 1978, pp. 27-54.

Preston A. J. and A. R. Pagan, The Theory of Economic Policy: Statics and Dynamics, Cambridge: Cambridge University Press, 1982.

Resnick, S., and R. Wolff, 'A Marxist Theory of the State', in L.L. Wade, edition, Political Economy, 1983, pp. 121-155.

Robinson, J., The Accumulation of Capital, London: Macmillan, 1956.

Robinson, J., Economic Philosophy, Chicago: Aldine Publishing Company, 1962.

Robinson, J., An Essay on Marxian Economics, London: Macmillan, 1966 (Originally 1942).

Robinson, J., Aspects of Development and Underdevelopment, Cambridge: Cambridge University Press, 1979.

Robinson, J. and F. Wilkinson, 'What has become of Employment Policy?', Cambridge Journal of Economics, Vol. 1, No. 1, March 1977, pp. 5-14.

Romer, C. D., 'Is the Stabilization of the Postwar Economy a Figment of the Data?', American Economic Review, 1986, pp. 314-334.

Rosen, S., 'Implicit Contracts: A Survey', Journal of Economic Literature, 1985, pp. 1144-1175.

Samuelson, P., 'The Consumer Does Benefit from Feasible Price Stability', Quarterly Journal of Economics, 86, 1972, pp. 476-493.

Samuelson, P.A. and R.M. Solow, 'Problem of Achieving and Maintaining a Stable Price Level: Analytical Aspects of Anti-Inflation Policy', American Economic Review, May 1960, pp. 177-194.

Sandford, C., The Economic Structure, New York: Longman, 1982.

Sandmo, A., 'Investment and the Rate of Interest', Journal of Political Economy, 1970, pp. 1335-1345.

Santomero, A.M., and J.J. Seater, 'The Inflation-Unemployment Trade-Off: A Critique of the Literature', Journal of Economic Literature, 1978, pp. 499-544.

Sargent, T.J., 'A Classical Macroeconometric Model for the United States', Journal of Political Economy, 1976a, pp. 207-237.

Sargent, T.J., 'The Observational Equivalence of Natural and Unnatural Rate Theories of Macroeconomics', Journal of Political Economy, 1976b, pp. 631-640.

Sargent, T.J., Macroeconomic Theory, New York: Academic Press, 1979

Sargent, T.J. and N. Wallace, 'Rational Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule', Journal of Political Economy, 1975, pp. 241-254.

Sargent, T.J. and N. Wallace, 'Rational Expectations and the Theory of Economic Policy', Journal of Monetary Economics, 1976, pp. 169-184.

Sargent, T.J. and N. Wallace, 'Some Unpleasant Monetarist Arithmetic', Federal Reserve Bank of Minneapolis Quarterly Review, Fall 1981, pp. 1-17.

Sargent, T.J. and N. Wallace, 'A Reply to Darby', Federal Reserve Bank of Minneapolis Quarterly Review, Spring 1984, pp. 21-26.

Sawyer, M.C. Macroeconomics in Question: The Keynesian-Monetarist Orthodoxies and the Kaleckian Alternative, Great Britain: Wheatsheaf Books Ltd., 1982.

Schumpeter, J.A., Capitalism, Socialism, and Democracy, London: Allen & Unwin, 1966 (Originally published in 1942)

Scase, R., 'Introduction', in The State in Western Europe, edited by R. Scase, London: Croom Helm London, 1980.

Seidman, L.S. 'Keynesian Stimulus Without Inflation', Journal of Post-Keynesian Economics, 6, 1983, pp. 37-46.

Sheffrin, S.M., Rational Expectations, Cambridge: Cambridge University Press, 1983.

Shepherd, W.G., 'Public Enterprise in Western Europe and the United States', in H.W. de Jong(ed.), The Structure of European Industry, Hague: Martinus Nijhoff Publishers, 1981, pp. 289-320.

Sherman, H.J., and G.R. Evans, Macroeconomics: Keynesian, Monetarist, and Marxist Views, New York: Harper and Row Publishers, 1984.

Sinkovics, A., ''Role of the State in the Economy'', Research Paper 8538, Universite de Montreal, August 1985.

Smith, A., The Wealth of Nations Great Britain: Penguin Books, 1978 (Originally in 1776).

Starr, R.M., ''The Structure of Exchange in Barter and Monetary Economies'', Quarterly Journal of Economics, May 1972, pp. 290-302.

Startz, R., ''Prelude to Macroeconomics'', American Economic Review, 1984, pp. 881-892.

Sweezy, P.M., The Theory of Capitalist Development, New York: Monthly Review(original 1942), 1970.

Syring, E.M., Jr. ''The Role of Human Wealth in Meltzer's Demand Function for Money'', Journal of Political Economy, vol. 75, no. 1, Feb. 1967, pp. 93-96.

Theil, H., ''On the Theory of Economic Policy'', American Economic Review, Paper and Proceedings, Vol. XLVI, May 1956, pp. 360-366.

Theil, H., Optimal Decision Rules for Government and Industry, Amsterdam: North-Holland Publishing Co., 1964.

Theil, H., ''Linear Decisions Rules for Macrodynamic Policy Problems'', in Quantitative Planning of Economic Policy, Edited by B.G. Hickman, Washington, D.C.: The Brookings Institution, ch. 2, 1965, pp. 18-42

Tinbergen, J., On The Theory of Economic Policy, Amsterdam: North-Holland, 1966(First Published in 1952).

Tinbergen, J., Centralization and Decentralization in Economic Policy, Amsterdam:North-Holland, 1954.

Tinbergen, J., Economic Policy: Principles and Design, Amsterdam: North-Holland, 1967.

Tobin, J., 'The Interest Elasticity of Transactions Demand for Cash', The Review of Economics and Statistics, vol. 38, no. 3, August 1956, pp. 241-247.

Tobin, J., Asset Accumulation and Economic Activity: Reflections on Contemporary Economic Theory, Yrjo Jahnsson Lectures, Oxford: Basil Blackwell, 1980.

Tobin, J., 'The Monetarist Counter-Revolution Today - An Appraisal', The Economic Journal, 1981, pp. 29-42.

Tobin, J., and W. Buiter, 'Long-run Effects of Fiscal and Monetary Policy on Aggregate Demand', in J. Stein(ed.), Monetarism, Amsterdam:North-Holland, 1976, pp. 273-309.

Tomlinson, J., 'Why was there never a 'Keynesian Revolution' in Economic Policy'', Economy and Society, Vol. 10, No. 1, 1981, pp. 72-87.

Tomlinson, J., 'Where do Economic Policy Objectives Come From? The Case of Full Employment'', Economy and Society, 12, 1983, pp. 48-65.

Tupper, A., and G.B. Doern, Public Corporations and Public Policy in Canada, Montreal: The Institute for Research on Public Policy, 1983.

Vane, H. and J. Thompson, An Introduction to Macroeconomic Policy, Brighton: Wheatsheaf, 1982.

Vatter, H.G. and J.F. Walker, 'Real Public Sector Employment Growth, Wagner's Law and Economic Growth in the United States'', Public Finance, 1986, pp. 116-138.

Usher, D., 'The Welfare Economics of the Socialization of Commodities'', Journal of Public Economics, 8, 1977, pp. 151-168.

Vaubel, R., 'The Government's Money Monopoly: Externalities or Natural Monopoly'', Kyklos, Vol. 37, 1984, pp. 27-58.

Venieris, Macroeconomic Models and Policy, New York: John Wiley & Sons, 1977.

Vickers, D., 'Uncertainty and the Uses of Money', Eastern Economic Journal, vol. 5, No. 3, 1979, pp. 337-348.

Vines, D., J. Maciejowski, and J.E. Meade, Demand Management, London: George Allen and Unwin Publishers Ltd, 1983.

von Mises, L., Economic Calculation in a Socialist Commonwealth, edited by F.A. Hayek, London: Routledge & Kegan Paul (originally 1920), 1935.

Wagner, A., 'Three Extracts on Public Finance', translated and reprinted as chapter 8 in Classics on the Theory of Public Finance, edited by R.A. Musgrave and A.T. Peacock, London: Macmillan, 1962, original German Publication 1883.

Walker, M., ed., Tax-Based Incomes Policies: A Cure for Inflation?, Vancouver: The Fraser Institute, 1982.

Wallace, M.S., 'Economic Stabilization as a Public Good: What Does it Mean?', Journal of Post Keynesian Economics, Winter 1983-84, pp. 295-302.

Ward, A., 'European Migratory Labor: A Myth of Development', Monthly Review, 1975, pp. 24-38.

Waugh, F.V., 'Does the Consumer Benefit from Price Instability?', Quarterly Journal of Economics, 58, 1944, pp. 602-614.

Weber, W.E., 'The Effects of Interest Rates on Aggregate Consumption', American Economic Review, vol. 60, no 4, Sept. 1970, pp. 591-600.

Weintraub, E.R., Microfoundations: The Compatibility of Microeconomics and Macroeconomics, Cambridge: Cambridge University Press, 1979.

Weintraub, S., An Approach to the Theory of Income Distribution, Philadelphia: Chilton Company, 1958.

Weitzman, M.L., The Share Economy, Cambridge: Harvard University Press, 1984.

Wells, C., 'A Reconsideration of the Causal Relationship between Money and Prices in Sweden, 1871-1970', Scandinavian Journal of Economics, 85(3), 1983, pp. 425-432.

Welsh, F., The Profit of the State, London: Maurice Temple Smith Ltd, 1982.

Whitney, S.N., Inflation since 1945: Facts and Theories, New York: Praeger Publishers, 1982.

Williams, M., 'Industrial Policy and the Neutrality of the State', Journal of Public Economics, 1982, 73-96.

Wolfe, D.A., 'Mercantilism, Liberalism, and Keynesianism: Changing Forms of State Intervention in Capitalist Economies', Canadian Journal of Political and Social Theory, 5, 1981.

Wright, C., 'Some Evidence on the Interest Elasticity of Consumption', American Economic Review, vol. 57, No 3, Sept. 1967, pp. 850-854.