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Appendix to Introductory Remarks for Teachers

The aim of this appendix is to provide greater detail concerning the reasons for my choice of topics in this textbook. These reasons stem from a combination of my judgements about the professional macroeconomics history and my assessment of the works of those who project that macroeconomics will continue without substantial change in substance. After an introduction, most of the appendix – parts two to four – presents a history of professional macroeconomics. This is followed by a critique of a proposed synthesis between "Keynesian short-run analysis and neoclassical long-run analysis."

1. ECONOMICS, MACROECONOMICS, AND THE REASON FOR STUDYING IT?

Defining Economics

In this book, I define *economics* as the study of interaction among distinctly human beings under specific conditions – the conditions of the market economy. These conditions are private property rights, specialization, and the use of money. I call interaction under these conditions *economic interaction*. More specifically, I define economics as the study of the *forms and patterns* of interaction under market economy conditions.

Macroeconomics

Macroeconomics does not fit neatly into this definition of economics. This subject, as it has evolved, reflects the decisions and judgments of professional economists, government officials, and even the general public. Beginning in the 1930s, professional economists followed the lead of journalists and the general public in expressing concern first about the "problem" of unemployment. A somewhat similar pattern of follow-the-leader occurred in the late 1960s and early 1970s when inflation began to outpace unemployment as a "problem" in the eyes of the journalists, the general public, and government. At a still later time, when neither unemployment nor inflation were serious problems, economic growth took the spotlight.[1] In light of these events, I define macroeconomics for the purpose of this appendix and text as *the study of the forms and patterns of economic interaction with special attention to the task of evaluating government policies that concern what professional economists have defined as the problems of economic growth, inflation and unemployment.* I place the problems in this order because the order reflects the significance of these problems today in the developed economies.

Actions and Institutions vs. Materials

My definition of economics differs from the usual definitions in the modern textbook. All of the modern textbooks emphasize the material environment. Human beings, they say, cannot completely satisfy their wants because the material means of satisfying them are limited. Such

[1] As Perry Mehrling (2005: 5) points out, "[m]acroeconomics developed as a response to institutional and intellectual changes that were taking place outside the confines of the discipline, and that development continues even today."

a definition is misleading because it implies that to study economics, one must study the material environment or, at least, to keep that environment in the back of her mind. This implication is typically reinforced by referring to the capacity of the physical environment to satisfy the wants of an increasing population and by referring to a production possibilities frontier for material commodities.

Economic Growth is Not Due to a Growth in Materials But to Growth in Human Capital

Such an approach is unsuited to a macroeconomics in which the major focus is economic growth. A cursory examination of the history of world growth (i.e., world real gross domestic product per capita), suggests that the main constraint on the satisfaction of consumer wants is the limitations of human capital and of the institutions that tend to promote its production and use. In other words, people are not constrained in satisfying their wants because the size of the earth and the materials it contains is relatively fixed. If this were true, earth's population as well as its per capital output of goods could not have grown to the extent it has over the past two centuries. The earth has not changed very much during that time. What has changed is human knowledge and how to use it..

The increase in human knowledge about their environment, which is one type of human capital, has, with the help of other resources, transformed the same raw materials that were practically always on earth into capital goods and consumer goods. The increase in knowledge was not a random event. It was due to the choices made by distinctly human actors. If one's goal is to explain growth and to evaluate government policies that might hasten it, the focus should be on why human beings are less constrained today than previously in spite of the relatively small changes in their physical environment. One should ask how the forms and patterns of interaction today compare with those of the earlier eras.

The Growth of Human Capital is Due to the Change in Institutions

This question, or something similar to it, is not new. The main objective of Adam Smith in the 18th century was to show why the "system of natural liberty" is the distinguishing characteristic of the more wealthy societies. The system that Smith identified is more or less what we would today call pure capitalism. With the expansion of socialist and communalist ideology in the 19th century, economics had to face the challenges of socialism and Marxism. Many of the individuals who are recognized today as the founders of neoclassical economics were stimulated to study capitalism more deeply by their desire to deal with these challenges. They added to our knowledge about the forms and patterns of pure capitalism.

It cannot be denied that material means are limited in the sense that human beings do not have all of the material means that they want. However, the study of the scarcity of material means does not capture the essence of the subject matter of economics, either with respect to the modern thrust of macroeconomics or with respect to the study of economics historically. The main interest of both the older economists and modern growth theorists is to study the ways in which the institutions associated with the market economy promote the production and distribution of wealth. And both attach the greatest importance to human capital and institutions.

Under market economy conditions, individuals specialize; they search for markets for the goods and services they specialize in producing; they produce human capital to cope with competition; they make and break employment compacts; they form enterprises to redistribute the uncertainty associate with long-term investments and to provide managers with incentives to raise profit by governing well and using their skills to predict future sales and cost; they form long and interconnected supply chains of enterprises owned and managed by different people; they speculate in organized futures markets in material capital and in durable goods; they borrow and

lend; they make long-term contracts; and so on. Before the rise of capitalism, these patterns did not exist. And, except for specialization and supply chains, they are not part of the set of socialist and communal institutions.

By focusing on the limitations of the material environment, the typical textbook misdirects the perspective of macroeconomics students on the nature of economics. Instead of being led to think of the incentives provided by private property rights, of competition in light of free enterprise, and of the prerequisites for using money in exchange; students are diverted to thinking about industrial and agricultural production. Instead of being led to think about human capital and the conditions under which individuals have an incentive to produce and use it; students are diverted to the study of production functions and production possibilities curves with discernable boundaries.[2]

Why Study Economics?

Human beings want to study forms and patterns of economic interaction partly out of *curiosity*. But their interest mostly stems from their *desire to improve what they perceive to be the well-being of themselves and others and to reduce a perceived deterioration in that well-being.* As a result, they focus on the interactions and forms of interaction that they believe they can control or that can be controlled by their hired agents. Macroeconomics is concerned specifically with the possibility of altering the interaction by means government policy.

The idea that the study of economics has a purpose constrains the reasons that a textbook writer can give for his choice of subject matter. As a matter of conscience and professional integrity, he must justify his choices in terms of this purpose. He cannot be satisfied with the rationale that he is teaching what macroeconomists do or what they have done, even if he persuades himself that he is doing it better than his predecessors. When faced with a choice of whether to include subject matter which has been of interest in professional macroeconomics, he must ask whether the material is relevant to evaluating the achievement of policy goals. He must make judgments about the relevance of what economists have done in the past and what they are doing now to achieving those goals. This, of course, is why I introduce this appendix with a discussion of economics and its purpose.

2. A HISTORY OF MACROECONOMICS UP TO THE 1970S

Modern textbooks in macroeconomic are naturally derived from the past six decades of the history of the macroeconomic profession. They are not merely a reporting of that history. They aim to represent a science – a body of knowledge in which inadequate, irrelevant, and even erroneous ideas have been replaced by ideas that are more adequate, relevant and correct. It should be obvious that such a goal cannot succeed unless the authors make judgments about what

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[2]One is tempted to ask why the textbooks writers have chosen to define economics in this way. Two possible answers come to mind. First, some economists wanted to discuss a second form of interaction – the centrally planned economy. The question they wanted to pose was whether a centrally planned system was a viable alternative to capitalism. To do so, they had to broaden the traditional definition of economics. Second, some economists wanted to promote the use of mathematics in economics. Materials exist in quantities and can be measured. Thus, a definition of economics in terms of scarce quantities amount is an invitation to a mathematician to apply his skills to help build economic models. It is likely that both of these concerns were motivations underlying the first of the textbooks by Paul Samuelson (1948).

belongs and what does not belong in the more permanent substructure of the science.[3] My own judgments will become evident in the description of history macroeconomics that follows.

Macroeconomics is Born and Captures the Profession

Until the post-World War II period, economists did not regard macroeconomics as a distinguishable subject within the broader category of economics. The turning point was the Great Depression (1929-35) and the subsequent belief that economists could help prevent a reoccurrence. During the depression, unemployment surged to an all time high in the US and other western nations. In addition, there was a fall in the average level of prices and wages; and the economic growth of the previous decade turned to economic decline. The vast majority suffered a reduction in their standards of living. Many attributed their condition directly to inadequate government policies. Others believed that something was wrong with capitalism and that government policies could be developed to correct for the deficiency. The most radical began to advocate socialism or some hybrid of socialism and capitalism. Practically no one was certain. In this environment of uncertainty, a number of economists felt challenged to identify policies that would avoid a repeat of the depression and enable unemployment and standards of living to return to their pre-depression levels.

One of these was John Maynard Keynes, a relatively young but highly acclaimed British economist at Cambridge, England. He wrote a book that claimed to answer the questions of how to prevent a depression and how to stop a depression once it had started. His book was not easy to follow, however, even by his fellow economists. The economists had to wait until subsequent expositors, or interpreters, presented the ideas in a more digestible form. This began to occur in the late 1930s and 1940s. When Keynes died in 1946, the task of transforming Keynes's answers into policies that a government could follow was inherited completely by the expositors and interpreters. The resulting policies were naturally called "Keynesian." Thus, in the minds of many economists, Keynesian policies and the logic to back them up provided the basis for a new field of economics – macroeconomics.

Two Boosts During the Post-war Period

In the US, interest in macroeconomic problems received two financial boosts at the end of World War II. The first was the Employment Act (1946), which resulted from the fear of a post-WWII repeat of the Great Depression. The act gave the US President a job that he had never had before – to guide the "macro-economy" with the goal of maintaining acceptable "levels" of unemployment, prices, and economic growth. To help him, the act mandated the creation of a Council of Economic Advisors (CEA).[4] Thus the act created jobs for a few economists that the president would appoint in order to give him advice. A comparable change had occurred in England a couple of years earlier. Although previous presidents during the century had sought advice from university economists, the new act, in effect, institutionalized this practice. The number of opportunities for economists to work with the government steadily increased over the years.

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[3]It follows that an author who fails to state or who conceals such judgments is doing a disservice to her colleagues and, by extension, to students who use her book.

[4]The initial act created a three-person council of equals on the apparent assumption that the President might receive conflicting views and that he could sort out which view was best. Differences among council members seems to have led to a 1953 reorganization in which a chairman was selected, who chose a staff of economic advisors to assist him/her (Stein 1996: 9). Also see Schultze (1996).

The hiring of university economists led to direct connections between the executive branch of government and some university economists. The relationship between the government's concern with macroeconomic problems and the "research" at universities was strengthened in other ways as well. Most importantly, government funding of economic research increased. Since the government's main focus at this time was the prevention of another Great Depression, funding was naturally channeled to economists who wanted to study this topic.

The second boost came in the form of a new subsidy to higher education – the GI bill. This bill provided college and university tuition to returning servicemen. It led to a doubling of college enrollments in 1946 and allowed later enrollments to be maintained in spite of the post-WWII disruption of the private demand for higher education. Thus, there was a government-induced increase in the demand for higher education at the very time that economists were involved in searching for answers to the question of how to avoid a new depression.[5]

The Textbook, the Baby Boom, and a Generation of Keynesians

The tentative macroeconomic policies of the expositors and interpreters of Keynes were incorporated in the first economics textbook for introductory students in 1948 by Paul Samuelson. The new textbook made it easier for economics teachers to introduce a new course into the typical college curriculum. Samuelson's book was soon followed by others who sought to further narrow the gap between the difficult logic needed to support Keynesian policies and the needs of classroom teachers for a means of cheaply and efficiently processing students through an undergraduate course. In these textbooks, macroeconomic policies were presented in the form of recipes that could be used by a government to solve the problems of unemployment and inflation. Students were required to learn the recipes.

In the 1960s, enrollments at colleges and universities increased greatly due mainly to the post-WWII baby boom, a higher demand by parents for their children's higher education, and increased subsidies to higher education. By that time, the professional economists who had chosen to specialize in the study of macroeconomic problems had established themselves sufficiently to divide introductory economics at practically all colleges and universities into two distinct fields: macroeconomics and microeconomics. The new textbooks that popularized this division became the training books for university students. Similar textbooks have continued in this tradition up to the present time, although the content of such books has changed.

The cumulative result of the production of macroeconomic theory and policies and their incorporation into the textbooks constituted an unprecedented change in the body of knowledge that was taught to students. The change is sometimes called the Keynesian revolution and the new macroeconomics as called Keynesian economics. Keynesian economics reached its peak in the mid to late 1960s.

To summarize, concern on the part of the public and the press about a repeat of the Great Depression led economists to develop new models of government policy based on Keynes's teachings. The economists proposed policies that they expected to solve the unemployment problem without leading to significant inflation and without reducing economic growth. The models and policy proposals were included in the new textbooks. Assistance in research and a subsidy to education helped create a higher education market for these ideas during the late 1940s and 1950s. By the time the baby boom generation began their higher education in the 1960s,

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[5]The relationship between government interests and higher education expanded in 1965 with the passage of the Higher Education Act, which increased federal money given to universities, created scholarships and low-interest loans for students, and established a National Teachers Corps,

macroeconomics had become separated from microeconomics and was regarded as equally important in the economics curriculum.

How Macroeconomic Policies Were Produced: a Merger of Professional Macroeconomics with Professional Econometrics

The models of the economy that were produced by Keynes and his followers proposed relationships among statistical aggregates, such as gross national product, spending on consumer goods, spending on investment goods, employment, and the price level. Such relationships were ideal subjects of study for two groups of economists who, before that time, were not especially important in the economics profession: econometricians and those involved in collecting statistics on the economy.[6] The econometricians believed that the field of economics needed a branch that would use statistical data to test hypotheses about the relationships among "economic variables" and about the effects of government policy on the variables. Its concern with "variables" made it inherently quantitative and mathematical. Variables imply mathematical equations and they refer to quantifiable phenomena. The econometricians saw an opportunity to apply their newly emerging estimation and forecasting techniques to macroeconomic problems.[7] The collectors of statistics naturally came to view the aggregate statistical data sets they had built with greater importance. They responded to the emergence of Keynesian macroeconomics by deliberately constructing their aggregates to suit econometricians who wanted to test Keynesian causal hypotheses and government advisors who wanted to apply Keynesian policies.

Keynes and his interpreters had built their early models on the assumption of simple correlations, such as that between household income and spending on consumption goods. The simple correlations were eventually replaced by multiple regression techniques that were used to test hypotheses about the relationships among the aggregate variables and about the effects of following a Keynesian policy.[8] By 1970, the merger between Keynesian macroeconomics and econometrics had culminated in the use of the more sophisticated vector autoregression analysis and the development of large computer models intended to simulate an economy. The new computer technology bolstered the confidence of the econometricians. And many macro-econometricians looked forward to the day that they would be able to build models that would show a benevolent despot exactly how to guide the economy toward prosperity. They envisioned a bright future for the use of new technology in helping to solve the problem of unemployment, while maintaining high economic growth and minimal inflation.[9] The financial backing of large

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[6]At the time, the first was best represented by the Cowles Commission; the second was represented by the National Bureau of Economic Research, associated first with Wesley Mitchell and later with Simon Kuznets.

[7]As Lawrence Klein, 1980 Nobel laureate in economics, wrote: "There is no doubt that econometrics received much encouragement from the widespread acceptance of the Keynesian theory of income determination and the associated development of national income accounting data on a broad scale. The Keynesian theory was simply "asking" to be cast in an empirical mold" (Klein 1971: 416).

[8]The first real test did not come until the Kennedy-Johnson tax cut of 1964. Thus, the hypotheses-testing referred to here was totally inferential.

[9]See Klein 1971:416-420.

public, quasi public, and private organizations also played a substantial role in the expansion of this form of macroeconomics.[10]

The application of mathematical and statistical techniques to the study of macroeconomic problems has had a huge impact on the study of economics, as defined above, and continues to do so. Macroeconomics today is dominated by professional economists who possess a high degree of skill in using econometric methods and knowledge of data banks, which is necessary to test hypothesis about various aggregate measures of economic interaction. What interests us here is whether the merger of professional macroeconomics with professional econometrics has achieved the goal of helping to solve the macroeconomic problems. We shall see that, considered broadly, there is not much basis for answering "yes."[11]

Professional Macroeconomists as Scientists and Engineers

By the 1970s, economics education had strayed far from the idea that economics is the study of the forms and patterns of economic interaction. The main reason was macroeconomics. By this time, macroeconomics had become the study of statistical aggregates. A graduate education required extensive training in mathematics, statistics, econometrics, and the availability of data bases.[12]

The macroeconomists believed themselves to be scientists and engineers. *As scientists*, they used the techniques of the rapidly advancing subject of econometrics to try to identify hypothetical causal relationships among the aggregates.[13] They asked, for example, whether an increase in the spending of government would cause a decrease in unemployment with only a small amount of inflation and no significant effect on economic growth. Under what conditions – that is, in the presence of which statistical aggregates – does this hypothetical causal relationship exist? These hypothetical causal relationships were incorporated in a variety of

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[10]These include the Bureau of Labor Statistics, the Cowles Commission, the Brookings Institute, the Federal Reserve Banks, the Department of Commerce, the National Bureau of Economic Research, universities such as Massachusetts Institute of Technology and the University of Pennsylvania, the Social Science Research Council, and Data Resources, Inc.

[11]In the following, I use the term econometrics as it seems to be understood by the typical professional economist. The experts in this field – the ones who produce the new techniques – are ordinarily more skeptical about the application of such techniques to the task of helping to formulate macroeconomic policy. This tension between professional macroeconomics and frontier econometrics comes out clearly in the writings of one of the foremost authorities in econometrics, Christopher Sims (2007).

[12]Even the subjects included under the category of microeconomics came to require this training, since the econometricians and mathematicians had succeeded in persuading most professional economists that the proper method of acquiring new knowledge was to propose testable hypotheses and then to use the methods of econometrics to test them. F. A. Hayek, who seems to have anticipated many of these developments, called this turn in the economics profession "scientism" (Hayek 1952).

[13]The limitations of using correlations to make inferences about causal relationships is well known. However, econometricians developed statistical methods of indirectly ruling out some variables as causes thereby leaving the strong suspicion that a remaining variable is a cause. The use of such techniques is subject to numerous caveats that only the experts know well. Thus only the experts can identify the special conditions that would have to be present for causation to properly, and of course tentatively, be inferred from correlation. Since such conditions are never actually present, the whole exercise takes on a flavor of abstract theorizing and, to the layperson, mystery. In any case, a seemingly accurate way to describe such activity is to say it is an effort to identify a hypothetical causal relationship.

models of "the macro economy." *As engineers*, the economists used the results of their studies to prescribe economic policy for the government and for the central bank.[14] Practically all of these models were Keynesian, although they were more complicated than those found in the early textbooks recipes.

Roughly speaking, the Keynesian macroeconomists of the 1950s and 1960s recommended higher government spending, reduced taxes, and/or an increase in the quantity of money in order to reduce unemployment. The opposite policies – reduced government spending, higher taxes, and a smaller quantity of money – were recommended to reduce inflation. The policy recommendations may perhaps best be captured by the phrase "fine-tuning," which was used in the textbooks. Under normal conditions the market economy can be expected to generate substantial wealth. Yet, it may not do so as efficiently as possible, owing to unemployment. Or, it may become overheated, as evidenced by too much inflation. To deal with these possibilities, the government should use fiscal policy (taxing and spending) and monetary policy (central bank-induced changes in the quantity of money) to improve its efficiency.

Since the economy is subject to change from all sorts of difficult-to-predict factors, an important part of a fine-tuning policy is the prediction of unemployment and inflation. If an abnormally high amount of unemployment is predicted, the government should spend more and tax less (expansionary fiscal policy), while the central bank should increase the quantity of money (expansionary monetary policy). If an abnormally high amount of inflation is expected, the government and the central bank should adopt the opposite policies (contractionary fiscal and contractionary monetary policy). It is important that these policies be adopted at precisely the right time. As a result, both the government and the central bank should have the discretion to change their policy when it is deemed appropriate to do so, in light of the predictions of macroeconomists. These policies have been called "demand management" policies because their purpose was to manage what Keynesians called aggregate demand: the government demand for goods and services, the demands of consumers for goods and services (by changing taxes), and the demands by businesses for investment goods and services (by changing the quantity of money that is lent to businesses).

Many Keynesian macroeconomists of the 1960s saw the policies in terms of a tradeoff. Demand management policies made it possible, they said, to have low unemployment but only at the expense of high inflation. Similarly, it would be possible to have low inflation but only at the expense of higher unemployment. As engineers, they presented the possibilities. It was up to "society" to decide which mix it wanted. The textbooks, of course, reflected this thinking.

Failure of Keynesian Policy Advice

The policies recommended by the Keynesian macroeconomists seemed to have worked in 1964, as a tax cut seemed to sharply reduce the unemployment rate and stimulate economic growth.[15]

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[14]This view of economics persists today, as evidenced by Gregory Mankiw's brief history of the development of macroeconomics (Mankiw 2006). We will discuss Mankiw's article below in greater detail.

[15]According to Stein, the first two groups of economic advisors to the president in the 1950s did not follow Keynesian policies. But the third group, which took their respective positions during the Kennedy Presidency in 1961, was Keynesian (Stein 1996: 9).

Whether the 1964 tax cut is regarded as successful depends very much on how one defines success. For an in-depth view of the thinking and the somewhat different pronouncements of the chairmen of the CEA, see Prachowny 2000. However, there is no doubt that unemployment fell and that real GDP rose subsequent to the tax cut; and that the effect on the price level was not large.

Toward the end of the 1960s, however, the rate of inflation began to rise unexpectedly. Keynesian efforts to correct for this failed. Then came a recession in which the unemployment rate rose and economic growth came to a crawl. Economists of the era labeled this combination of events "stagflation." The existence of this conditions was contrary to the Keynesian teachings. By the mid-1970s, it became evident that the policies advocated by the Keynesian macroeconomists had not achieved the goals that their proponents believed they could achieve. Moreover, by this time there had been troubling attacks on the theory itself.[16]

Monetarism

The first prominent challenge to Keynesian macroeconomics came from Milton Friedman and Anna Schwartz, as early as 1963. They studied the history of the relationship among several of the aggregates, especially the quantity of money, the average price level, and the real gross domestic product (GDP). On the basis of their studies, they concluded that, over the years, changes in the quantity of money have been followed *in the short run* by changes in employment and real output. But *in the long run* it had been followed by inflation only. Increases in money also tended to exaggerate business cycles. This suggested that expansionary monetary policy could not be effective in the short run at reducing unemployment except by causing long run inflation and reducing economic growth.[17] It could not be effective in the long run at all. In addition, Keynesian monetary policy might cause greater macroeconomic problems. The results of their study were bolstered by the case of Japan, which by 1980 had one of the highest sustained growth rates in the world. By the mid 1970s, Japan had driven inflation out of its economy by controlling its quantity of money. Moreover, the unemployment rate had not been particularly high, once the goal of driving inflation out was achieved.

A second aspect of Keynesian policies came to fore in the late 1960. In their haste to promote Keynesian fiscal policies, many Keynesians had neglected the fact that budget deficits must be financed and that surpluses lead the government to end up with extra money.[18] For example, many failed to realize that increased government spending or reduced taxes, by itself, would crowd out private borrowing for investment by raising the market rates of interest. Economists called this idea the *crowding out effect* of fiscal policy. The crowding out effect implied, in the Keynesian logic, that unless one could assume that the government could influence the economy by changing the *size* of a *balanced budget*, fiscal policy alone – i.e., unless it was financed by newly created money – could not significantly effect the economy.[19] This left monetary policy.

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[16]See Lucas and Sargent 1979.

[17]Strictly speaking, this applies only to Keynesian monetary policy. However, since expansionary fiscal policy requires an increase in the quantity of money (otherwise, the borrowing to finance it crowds out investment spending), the broad thrust of the argument was to undermine all of the Keynesian theory.

[18]Part of the reason for this neglect is the failure to consider how decisions on the budget are made. Today, there seems little dispute that if politicians are permitted to increase the budget for any reason, they will often use the money for projects that are not economically sound. For more on this, as well as an analysis of the various budget policies proposed by Keynesians, see Buchanan and Wagner 1977, especially Chapter10.

[19]Defenders of Keynesian fiscal policy – and there seem to be some in spite of its impracticality due to a political time lag – have erred in thinking that the crowding out effect must be shown to exist empirically. It is a simple logical deduction. Money that would otherwise be borrowed by business gets diverted to government, while households divert more money away from consumption in light of the

Yet Friedman and Schwartz seem to have effectively shown that monetary policy would cause more problems than it solved.

The combination of Friedman and Schwartz's study of monetary history and the crowding out effect instituted a new way of looking at government policy. The demand management policies had failed. Moreover, they had led, in Friedman's view, to a bloated government and a growing problem of inflation.[20] Government spending, government debt, and the price level had steadily increased during the years of the policies. So Friedman and others advocated that fiscal policies be abandoned and that the central bank follow a simple rule. According to this rule, changes in the quantity of money would match the change in real GDP growth. This rule was later amended and it has since been presented in a number of different variations. Followers of Friedman called this set of recommendations and the econometric findings on which they were based *monetarism*.

Supply-Side Economics

One of the effects of focusing on macroeconomic policy during the 1960s was to neglect the microeconomic effects of spending and taxing. First consider spending. In carrying out the large and growing amount of government spending, governments had caused the control over resources to be shifted away from the private sector into the public sector. Some types of government spending generate more consumer benefits than the foregone private sector benefits. However, some economists argued that for much of the spending, this had not been the case. It had cost more in terms of lost private sector production than the benefits. First, some of the spending had been earmarked for the pet projects of politicians, which cost more than they were worth. Second, some of the spending was used to hire resources in government-managed businesses. Because government managers do not possess the profit incentive and since they often make decisions for political purposes, the goods or services provided by these businesses were supplied less efficiently than they would have been in the private sector. As a consequence, the government-managed businesses needed subsidies or special monopoly privileges in order to survive. Third, even when the government financed services that most people would agree have greater benefits and costs, the government often *produced* these services when it could have *hired* them under contract from the private sector at lower cost. Fourth, during the 1960s and early 1970s, the

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higher market interest rates that are caused by the government borrowing. The defenders often blur the logic by adding foreigners to the domestic loan market or by following the old, mistaken Keynesian logic that saving may not reach investors. The first point is merely a diversion. It can be answered, from within the framework of an expanded Keynesian model by referring to the effect of the increased borrowing from foreigners on the foreign exchange rate and, subsequently on exports and imports. The second point, while true in fact, is not relevant to the logic of the model, which assumes a loanable funds market in which all household loan money does reach investors and assumes a monetary system in which banks are fully loaned up. This assumption can, of course, be relaxed. But to relax it renders other, more dogmatic and logically correct Keynesian conclusions suspect. For example, to relax the "fully loaned-up bank assumption" implies that an increase in business demand for investment funds, perhaps due to a technological advance, would not necessarily lead to a rise in the interest rate. Or it may lead to a higher rise in the interest rate than is possible to deduce from a simple loanable funds model. Moreover, there is no assurance that monetary policy would have the effects described in the models. One cannot hope to succeed in teaching undergraduate students the effects of a policy with the framework of a particular model when counter arguments that are made within that framework are met by changing the assumptions of the basic model.

[20]These views were perhaps best expressed in his popular book, co-authored with his wife, which was also a television series. See their *Free to Choose* (1981).

government had expanded the number wealth transfer programs. These programs reduced the incentives of payers to supply their work and entrepreneurship. Many of them also seemed to reduce the incentives of the recipients to supply work and to produce human capital for the private sector. Finally, the government had financed a number of business regulations that both raised the costs of supplying goods in the private sector and reduced international competitiveness. In short, many of the government spending programs had caused real GDP to be less than it otherwise could have been.

Now consider taxes. The greatest focus was on the tax rate on high incomes and the tax on income earned from saving. Some economists argued that the high marginal tax rate had discouraged high income-earners from using their talents to a fuller extent in the service of consumers, while the tax on income from saving had discouraged income-earners from lending to businesses.

The rallying point of these economists was the argument that the aggregate spending and taxing policies of the government could be changed in such a way that real GDP would rise. Wanting to set themselves in opposition to the Keynesians, who sought to affect the economy through demand management, these economists called themselves *supply-side economists*, suggesting that their aim was to raise aggregate supply.[21] On the spending side, they proposed reducing the size of government spending, privatization, contracting-out to the private sector, and deregulation. On the taxing side, they proposed reducing the marginal tax rate on the highest incomes, and reducing or eliminating the tax on saving and investment. Regarding monetary policy, they argued that unexpected changes in money had raised the level of uncertainty and reduced incentives to do business. In addition, the changes had led some entrepreneurs, who otherwise would be producing goods for consumers, to gamble on the prices of durable goods and financial assets. Thus, they supported the monetarist position of stabilizing the price level.

Requiem for Discretionary Macroeconomic Policy

During the early years of macroeconomics, Keynesians struggled to persuade policy makers in the US that macroeconomic policy is needed to guide an economy. Their greatest long-term success during these years came in the universities, where they were able to replace the traditional study of economics with the now-familiar textbook that is divided into two parts. Throughout the 1950s and 1960s, a generation of university students learned from such textbooks that the market economy is inherently unstable and that discretionary fiscal and monetary policy can correct this deficiency. They also were taught that the macroeconomist is a scientist who uses historical data to predict the future by means of identifying economic indicators. Advanced economics students were taught that the economist tests hypothetical causal hypotheses about

[21] See Paul C. Roberts 1984 for a more detailed description of supply-side economics. Supply-side economics is poorly represented in the textbooks. There are basically two representations. The first represents it by using a model in which a cut in the tax rates raises aggregate supply. There is no reason to think that supply-siders would, on the whole, accept aggregate demand-aggregate supply analysis. However, if they did, they would distinguish between a decrease in tax rates and a decrease in aggregate taxes, as this notion is usually understood. Thus, it would be wrong to say that a decrease in tax rates has two effects: to increase aggregate supply and to increase aggregate demand. Whether there is an increase in aggregate demand, according to the logic, would depend on whether total taxes were higher or lower. Similarly, an increase in government spending that is not financed by new money would reduce aggregate supply as well as not cause an increase in aggregate demand due to the crowding out effect. Similarly, a decrease in government spending would raise aggregate supply. The second claims that there is no significant empirical evidence for supply-side economics. If this criterion was applied to fiscal policy outcomes generally, it seems likely that the system would fall apart.

the effects of policy and, more generally, about the nature of the economy, by using the advanced tools of econometrics to analyze aggregate data. Finally, the students were taught that the macroeconomist, as an engineer, stands ready to give advice to government on how to achieve its goals. Largely as a result of this teaching there was, by the 1960s, a substantial number of intellectuals who believed that the government, aided by the right economists, could stop unemployment and counter a recession with expansionary fiscal and monetary policy. No doubt, this intellectual atmosphere made the Kennedy-Johnson tax cut in 1964 more palatable than it otherwise would have been. It also left these same intellectuals befuddled by the stagflation of the early 1970s. The 1980s brought a big change. But how to describe it?

One way is to describe the facts. With little to guide them in the late 1980s, some governments followed a supply-side fiscal path by raising incentives to do business and to work. Among other things, they reduced their high marginal tax rates and eliminated some of the benefit programs to non-workers. In the monetary arena, central banks sought to control inflation. Macroeconomic researchers at universities, at publicly and privately-funded institutes, and in the government produced models that debunked the idea that 60's style fiscal and monetary policies could be effective. For the CEA, the idea of using deficit spending as a solution to a perceived unemployment problem virtually disappeared.[22]

A second way to describe economic policy is to link it to progress in "economic science."[23] A story of this type might assert that in the economics profession, good economics ultimately triumphed over bad and that this was followed by intelligent policy making in Washington and other national capitals. As a result, the US and most advanced nations have enjoyed almost two decades of stable growth.

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[22]It is now over a decade since former CEA chairman (1976-80), Charles Shultze, wrote that "the greater activism of the Federal Reserve, has for the time being at least, lowered still further the already modest attractiveness of fiscal policy as a countercyclical tool, except in response to very large or prolonged aggregate demand shocks" (Schultze 1996: 36). During the ensuing decade, fiscal policy has become even less popular and the prospect for Federal Reserve "activism" has declined.

[23]Paul and Christina Romer write about an "evolution of economic understanding." They hypothesize an

> interesting evolution from a crude but fundamentally sensible model of how the economy worked in the 1950s, to more formal but faulty models in the 1960s and 1970s, and finally to a model that was both sensible and sophisticated in the 1980s and 1990s (Romer and Romer 2002: 12).

A critique of the Romers' interpretation has been presented by Sargent (2002). Also see Cogley and Sargent (2005).

Robert Lucas, a Nobel laureate (1995), seems to partly use the Romers' "evolution of understanding knowledge" as a basis for reaching a rather pessimistic conclusion about the likely contribution of scientific macroeconomics to future macroeconomic policy. Referring to that policy as "stabilization policy," he writes:

> [Do] stabilization policies that go beyond the general stabilization of spending that characterizes the last 50 years, whatever form they might take, promise important increases in welfare[?] The answer to this question is "No." The potential gains from improved stabilization policies are on the order of hundredths of a percent of consumption, perhaps two orders of magnitude smaller than the potential benefits of available "supply-side" fiscal reforms (Lucas 2003: 11).

In reality, politicians typically only follow the advice of economists when they perceive a political advantage.[24] Moreover, since economists began to think that they could give useful advice to the government about macroeconomic policy, there has been a remarkable lack of agreement among economists on what the best macroeconomic policy should be.

Whatever story one might want to tell about the economics profession, two facts about U.S. macroeconomic policy since 1960 stand out. First, the expansionary monetary policy of the 1960s led from "creeping" inflation, at first, to a "galloping" inflation that was intolerable. The inflation rate stayed high during the 1970s and did not fall back to its pre-1970s rate until the 1980s. By the early 1970s, there was also high unemployment, which was to remain throughout the 1970s and 1980s. Second, when the Federal Reserve Chairman began in the late 1970s to take actions that amounted to targeting inflation, the inflation rate came down and, ultimately, the unemployment rate also fell to acceptable levels. From the early 1990s till today, the US has experienced low inflation and low unemployment, while enjoying relatively high economic growth, as compared with the previous two decades. These events have occurred without the kind of discretionary fiscal and monetary policy envisioned by the macroeconomists of early Keynesian macroeconomists.

3. INTERNATIONAL TRADE AND KEYNESIAN POLICIES[25]

After World War II, Keynesians were trying to persuade governments to adopt the policies that were supported by their emerging theories. During the same time, the major nations of the free world had made a pact that ushered in what was ultimately to become a second "golden age" of international trade: the General Agreement on Tariffs and Trade (GATT). Throughout the world, subsequent trade agreements gradually diminished trade barriers (tariffs, quotas, quality standards), many of which had been legislated during the great depression of the 1930s. International trade grew slowly at first. But then it took off. Roughly speaking, by the end of the 20th century, international trade had grown from 10 per cent of real global GDP to over 40%. By this time, Japan and a number of Asian followers had achieved several decades of high growth largely through trade; the Europeans had created the European Union (EU); the Americans had created the North American Free Trade Association (NAFTA); China and India, the most populous nations of the world, had liberalized; and the former Soviet republics had been set free to join the international trading system if they wished. In 1995, the members of GATT formed the World Trade Association (WTO) partly in order to welcome new members from around the globe and to help them build the infrastructure necessary to be full-fledged members of the system.

The postwar sentiment toward international cooperation through trade was in sharp conflict with the Keynesian economic policies that were being advocated during the 1940s and 1950s and actually implemented in the 1960s. To see why, one must appreciate the leadership role that the US adopted in international currency markets. In preparation for post-WWII recovery, all of the

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[24]In addition to the reports on the CEA by Shultze and Stein cited above, see Friedman's discussion of Federal Reserve Bank action prior to 1982 (Friedman 1982).

[25]The account in this section is based partly on Robert Mundell's revision of his Nobel Prize lecture in 1999, although it leaves out many details that Mundell would probably want to emphasize. Mundell's paper appeared in the *American Economic Review* in 2000. The account here is also quite abbreviated and omits a number of facts that a more thorough analysis would include.

major trading nations had agreed to the international dollar standard, a system that was worked out at Bretton Woods, New Hampshire, in 1944. This system made the US dollar the new international monetary standard, to replace the gold standard of an earlier era. The widespread adoption of the system was based on the US agreement to exchange gold for dollars at a price of $35 an ounce for the indefinite future. In the early post-war years, the US economy was so large and the role of the US in aiding the international reconstruction effort so big that the new system worked well. The US had plenty of gold to support the dollar standard. In the 1950s, as Japan and the nations of Europe recovered from the war, this started to change. Although the US kept growing, its economic power relative to the rest of the world declined sharply. In addition, the US began to import more goods than it exported. Since the dollar was an international currency, the people and governments of other nations began to accumulate dollars and debts denominated in dollars. After a while, a number of holders decided to exchange the debt for dollars and asked the US to exchange the dollars for gold.

If the transfer of gold had proceeded according to the Bretton woods plan, gold would have flowed out of the US and into other countries. At the same time, the US money supply would have fallen. Every dollar that was spent on an import and then turned in by a foreigner for gold would have disappeared from the US. To a Keynesian, this implies contractionary monetary policy. The anticipated result, according to the models of the time, was higher unemployment. Naturally, the Keynesians strongly recommended against reducing the quantity of money. The government followed this recommendation.

The situation was not sustainable. Failure to reduce the quantity of money meant that prices in the US would stay high, in terms of gold, prompting more imports and fewer exports. Foreigners were bound to want even more gold. Nor was the situation temporary. The relative economic power of the US was set to decline for decades. Eventually, unless changes were made, the US would have no gold left. The Bretton Woods monetary system would collapse. This also seemed unacceptable, since many believed that the failure of the world monetary system was a major cause of the worldwide great depression in the 1930s.

In spite of these facts, the US government, following Keynesian recommendations, engaged in expansionary monetary policy in the mid-to-late 1960s because it was worried about domestic unemployment. The creeping inflation of the mid-1960s turned to galloping inflation by the end of the decade. Demands to trade dollars for gold increased and the US decided in 1971 to renege on its agreement to trade gold. Dollars could no longer be exchanged in the US for gold. They could only be traded for US goods and services. Thus, US macroeconomic policy contributed to the destabilization of the international currency because of the key role played by the US in the postwar monetary system. This destabilization further added to the woes of the 1970s because it meant that every nation in the world had to adjust to a new international exchange regime. Currency markets were disrupted for several years. Thus Keynesian economic policies not only turned out to be the wrong way to help the US economy, they damaged the international trading system.

One way to think about what happened is to recognize that Keynesian macroeconomics is nationalistic. It focuses on how the government *of a single nation* can deal with unemployment, inflation and economic growth. Even if it could have been effective in dealing with these problems, which is doubtful, the implementation of these policies would have disrupted the international trading system because of the US's dominant its postwar position.

By the early 1990s, the Keynesian policies that had been so disruptive during the late 1960s and 1970s were gone. Inflation targeting and other inflation-reducing policies of the US central bank had eliminated inflation as a problem and there was little prospect for expansionary monetary policy again. The high inflation that had resulted from the Keynesian policies had been driven

out of the US economy. The same is true of other major trading nations.[26] As a result, international trading companies could avoid much more of the exchange rate risk involved in making advance contracts. The rapid growth of international trade continued.

4. FURTHER DEVELOPMENTS IN MACROECONOMIC SCIENCE

With the exception of economic growth, our history of macroeconomics stopped abruptly with the emergence of supply-side economics and governments' adoption of the policy of inflation targeting and other inflation-reducing policies. Since the 1970s, the best minds in macroeconomics have continued to produce theories that purport to be relevant to unemployment and inflation. However, there is little left today of the ideology of fine-tuning that was pervasive among the economists of the 1960s. What remains is the use of increasingly sophisticated mathematical models to represent theories about the relationships among aggregate data. Correspondingly, increasingly sophisticated econometric techniques are used to test hypotheses that are derived from the theories. Since there is very little economic policy being conducted,[27] the tests are mainly a vehicle for describing relationships about data that existed historically. An almost unfathomable variety of models have been produced for this and that purpose.

Gregory Mankiw (2006: 33-9), the writer of perhaps the most popular current text in introductory economics, identifies five major goals of these models: (1) to evaluate the argument that macroeconomic policy is ineffective, (2) to represent models of business cycles, (3) to relate Keynesian economics to the classical economics proposed by monetarists and others, (4) to describe the relationship between a number of aggregate variables and economic growth, and (5) to develop a new model which can be described as a "scientific" synthesis of the theoretical work that preceded it.

Mankiw appears to place his hope for the future of macroeconomics in the so-called "scientific synthesis." This is convenient for him because, if the synthesis turns out to be correct, there would be a good reason to continue to teach the Keynesian model of aggregate fluctuations, along

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[26]"According to the 2005 World Economic Outlook from the International Monetary Fund (IMF 2005), consumer price inflation in the advanced economies over the decade beginning in 1997 looks set to come in at an average annual rate of less than 2 percent, down from 3.5 percent for the previous 10 years. The IMF figures for the United States show a smaller but still substantial decline in headline inflation, from about 3.75 percent to 2.5 percent....[In economies] designated by the IMF as 'other emerging market and developing economies' CPI inflation...has fallen from an average of nearly 57 percent in the 1987–96 period to an average of 7.5 percent in the 1997–2006 period" (Ferguson 2006).

[27]Of course, the CEA still exists and so does the policy-making board of the Fed. In other nations, the situation is similar. The Fed especially is still regarded by journalists as important. However, the actual actions that the Fed takes in today's US economy are dominated by a concern about inflation. The idea of causing a large increase in the quantity of money to solve a substantial unemployment problem is very distant from the day-to-day concerns. What appears to have happened is that the inflation-targeting policies of the last two decades by the US and other economic powers, in combination with a more stable international exchange system, have made substantial changes in unemployment less likely. If, somehow, the Fed came to predict a very high unemployment rate, say 12 per cent, it is difficult to say that the Fed would not try expansionary monetary policy again. At the same time, it is difficult to imagine that any event short of a war or a major environmental catastrophe could lead to such a prediction.

with a history of developments in professional macroeconomics that have occurred throughout the last three decades. His textbook, like practically all of the others used today, is based on that model. At the same time, he comments that the research program associated with this synthesis is too abstract and insufficiently practical (*ibid*.: 39). "[M]odern macroeconomic research is not widely used in practical policymaking...The research may have been successful as a matter of science, but it has not contributed significantly to macroeconomic engineering" (*ibid*.: 43). If we interpret these remarks in terms of the definition of macroeconomics given above, they imply that the research has not been helpful in evaluating government policies toward unemployment, inflation, and economic growth. This interpretation corresponds to that of the Romers and Lucas discussed in footnote #23.[28] Why he classifies the development of new causal relationships among aggregate variables as science, if it does not contribute to the making of policy recommendations, is unclear.

It appears, therefore, that the initial reasons for studying macroeconomic policy have disappeared. As pointed out above, the desire to bring inflation under control in the 1970s resulted in a reality that led both governments and economists to the conclusion that inflation targeting is the only macroeconomic policy worth using. If it is used, unemployment will not be a periodic problem, inflation will not be a problem, and the absence of central bank-initiated "monetary shocks" will help promote economic growth. If this is true, what is the further need for macroeconomics? Whatever answer we give to this question, the fact is that there is no significant movement in the economics profession to do away with this subject.

In any event, as pointed out earlier, a writer of a new textbook like me must make judgments about whether this new research, along with other developments in professional macroeconomics over the last two decades, is worth teaching. The purpose of this subsection is to state these judgments and the reason for making them. I follow Mankiw's five major goals of current macroeconomic models. In the following two subsections, I describe judgments regarding, respectively, business cycle research and economic growth research. The new synthesis is discussed in the next part.

Business Cycles

Econometrics might be called the child of business cycle studies. Early in the 20th century, Wesley Mitchell and his successor Simon Kuznets wanted data first that would testify to the presence and character of business cycles and second that might help economists discover the causes of business cycles. As Keynesian economics was being developed in the 1940s and 1950s, the interest of the data masters was redirected. Mitchell died in 1948 but Kuznets and his colleagues carried on the project. The data goal became that of helping Keynesian economists acquire the information they needed to determine the proper policy or policy mix to achieve the macroeconomic goals. During the same period the goal of the early econometricians shifted to that of developing models that would enable Keynesians to determine whether their causal theories matched the data of the past and to enable them to make predictions of the future. Later in time, econometric models were used to challenge Keynesian theories. We have mentioned how Friedman's mid-1960s econometric study showed an historical relationship between increase in the quantity of money and the severity of business cycles. In describing this relationship, Friedman was using the data and econometric techniques at least partly for their original purpose – to find out about business cycles.

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[28]Why he classifies the development of new causal relationships among aggregate variables as science, if it does not contribute to the making of policy recommendations, is unclear.

In presenting his work in the mid-1960s, Friedman did not emphasize the business cycle aspect. Later economists were to follow up on Friedman's business cycle work, while broadening its focus. Whereas Friedman was concerned with business cycles caused by changes in the quantity of money, the new business cycle theorists built models of business cycles that are caused by "technology shocks," "supply shocks," and "demand shocks." They labeled their studies "real business cycle theory," apparently in order to distinguish them from Friedman's concerns.

These economists built models that were quite different from those of the early business cycle theorists.[29] In these models, the economy is assumed to always be "in equilibrium." The theory begins with a static state in which economic agents repeat the same behaviors again and again. Then a shock of some sort occurs. Agents immediately adapt to the shock. Although each adaptation is instantaneous, a progression of adaptations, in combination with certain assumptions about the environment, are introduced for the purpose of tracing out a cycle "during" which various different aggregate variables change in a systematic way that is specified in the model.[30]

In presenting these models, the modelers employed an entirely mathematical, or engineering, notion of equilibrium. They completely disregarded the older notion of equilibrium as a hypothetical state that we can imagine coming into existence after a period of coordinating actions.[31] As a result, the models were appropriately criticized as not having anything to do with real human behavior. Indeed, the models are derived from the data rather than being independent of the data. As models of data, they cannot be used to generate hypotheses about what caused the data and, therefore, cannot be compared with other hypotheses.[32] The representations are not relevant to economic policy.[33] We shall have more to say about coordination in part six of the

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[29]Some of these early theorists are described by Delong (1996).

[30]These models were championed by Nobel laureates Finn Kydland and Edwin Prescott (1982).

[31]An example of the disregard for the older notion of equilibrium is Lucas and Sargent's discussion of equilibrium business cycle theory in their 1979 paper.

[32]These are the conclusions of Stadler (1994) and James Hartley et. al. (1997). Both writers refer to a basic fallacy described by Kinman (1992). The models are not about real human interaction because their assumption of a representative agent does not permit them to represent interaction among agents. The same criticisms apply to the so-called "real business cycles" of another nobel Laureate, Robert Lucas, who presented what he called an equilibrium theory of the business cycle as early as 1975. Lucas describes the framework for constructing such theories in Lucas 1977. This tradition of trying to identify "empirical laws" goes back to Solow and Samuelson's use of the aggregate production function and ultimately to the attempt to estimate the Cobb-Douglas production function (Felipe and McCombie 2005: 468; Felipe and Adams 2005: 428-9). It is deficient for exactly the same reason – it permits no market interaction.

[33]The "aggregate shock" concept seems irrelevant, almost to the point of being silly for two reasons. First, the idea of a shock that impacts on aggregate variables without first causing a complex set of price signaling, adjustments, and coordination in particular markets is difficult to match with any known real world event. For example, an oil price hike by a presumed cartel of suppliers would first effect the decisions of individuals who aid in the supply of multiple kinds of energy. It is impossible to imagine how it could affect all costs of production equally, thereby driving up all prices equally. To assume an aggregate impact without describing the impact on particular markets would be foolish. It is true that everyone would be affected. But the effects are different on different people and they occur at different times. Second, even if the concept of an unanticipated "shock" could be usefully applied to describe some

introduction. The point we want to make here is that real business cycle research appears to be a dead end, at least insofar as one's goal is to present a realistic explanation of the actions that people would take as the result of a particular shock.[34]

Economic Growth

Economists have been concerned with economic growth since the beginning of economics, two or three centuries ago. Postwar Keynesian macroeconomists, however, focused on unemployment and inflation and showed little interest in growth. Now that Keynesian fiscal policy goals have been replaced by supply-side concerns and inflation targeting has become the dominant goal of monetary policy, economic growth appears to have risen to the highest status among the three problems studied by macroeconomists. This is partly the result of the choice by a number of macroeconomists in the latter part of the 1980s to direct their model-building and econometrics skills to the study of the variables that are associated with growth. As time passed, this field attracted an increasing number of economists.

Economic growth had not been ignored by early macroeconomic econometricians. A macroeconomic model of growth was developed in the 1950s (Solow 1956 and Swan 1956). The model assumed that real GDP was a function of the material resources – labor and capital. This so-called aggregate production function could shift as a consequence of forces outside the model, namely technology. The model suggested that GDP depended mainly on private investment that would raise the amount of capital goods. A government might help to increase economic growth by stimulating investment and promoting technological advance. A number of econometrics studies of the relationship among these variables had been carried out before the new interest in economic growth began. Since they were not related to Keynesian economics, they were not regarded as part of the corpus of macroeconomics.[35]

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event in the real world, the idea that the effects of a future "shock" will be the same, or similar, to the effects of a past "shock" of the same general type – when the economy is changing for all sorts of reasons – seems preposterous.

[34]In the 1979 paper mentioned above Lucas and Sargent described real business cycle research as an attempt "to discover a particular, econometrically testable equilibrium theory of the business cycle, one that can serve as the foundation for quantitative analysis of macroeconomic policy" (page 8 of internet .pdf version). They say that following Arrow and Debreu, equilibrium means only that two conditions are satisfied: "(a) that markets clear and (b) that agents act in their own self-interest" (*ibid*.: 9). They completely overlook coordination. The condition that "markets clear" really means that "quantity demanded equals quantity supplied in each market." There is no "clearing" activity in their model.

[35]The technical name for this theory is "neoclassical growth theory." The term "neoclassical" seems a misnomer since it neglects the growth theory of Carl Menger and Frank Knight, which are discussed below. These economists did not regard growth as a function of labor and capital, as we shall see. Another writer who does not fit into this mold is Allyn Young (1928), who tried to incorporate Adam Smith's theory into the marginal productivity theory of distribution. Before the rise of macroeconomics, this theory was referred to as neoclassical economics.

A second reason for the inappropriateness of this name is the cogent critique by Joan Robinson in her contribution to the "Cambridge capital controversy." In appearance, the aggregate production function is based on the marginal productivity theory of distribution, which assumes that factors tend to be rewarded according to their contribution to the revenues of firms. Neoclassical economics, at the time she wrote, ordinarily referred to this theory. The theory implicitly assumes that entrepreneurs must expect to profit in order to direct the factors to their most efficient uses. Yet the aggregate production disregards profit (Pressman 2005). In response, Samuelson and Solow asserted that the function is nevertheless

The "new" growth theory proposed in the late 1980s vitalized macroeconomists' interest in economic growth.[36] The theory argued that growth is inherent in a capitalist system (it is "endogenous") and need not come from outside. Or, perhaps more accurately, it tried to incorporate technological advance as a variable into the model by identifying characteristics of the capitalist system or of people and their actions that would cause what had been assumed by the earlier macroeconomists to be exogenous technological advance to occur. In the following two decades, models were produced and econometric techniques were used in an effort to identify which features of a capitalist system contribute, in an econometric sense, to economic growth.[37]

The new growth theory seems to have resulted in two significant factual discoveries or verifications. The first and earliest is the relatively strong relationship between human capital and economic growth.[38] When a variety of other variables are also taken into account, growth in real GDP seems to be independently correlated with growth in various statistical measures of human capital. The second is the strong correlation between "institutions," again with a variety of other variables accounted for, and economic growth. Institutions, roughly speaking, refers to private property rights[39] and the rule of law (Rodrik et. al. 2004: 132).[40] There are very big problems with

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useful because econometric research shows that there is a definite relationship between real GDP and capital and labor. This is a strange justification, at least for someone who prides himself as an economic theorist. In any event, the initial correlations upon which the Samuelson-Solow assertion was based turn out to be spurious (Felipe and Adams 2005; Felipe and McCombie 2005; Fisher 2005). When a definitive history of macroeconomics is ultimately written, the Samuelson-Solow "neoclassical growth model" will surely be regarded as one of the greatest errors in the subject. And all those who have regarded it as a useful reference in their own work will be compelled to rethink that work. Perhaps at that time, the use of the term "neoclassical" to describe it will also be questioned.

[36]For a discussion of the origin of this theory, see Romer 1994.

[37]Of course, it was not new to argue that growth is inherent in the capitalist system. The term "new" applies only to the fact that these writers, like their "neoclassical growth theory" predecessors, used econometric methods. Whereas "neoclassical growth theorists" developed econometrically testable models to generate hypotheses about the relationship between real GDP and material resources, the new growth theorists developed similar models aimed at characterizing the relationship between real GDP and a variety of characteristics of the capitalist system.

[38]For example, Jones (2002) attributes economic growth mostly to research intensity and educational attainment.

[39]See Heitger 2004.

[40]William Baumol, concludes a recent paper on the subject with the following remarks:

> In the end, there seems to be little mystery about what underlies the market economy's unprecedented growth performance...The most powerful components of the mechanism are constituted by a combination of the profit motive, confidence that one can keep what one earns, and the competitive pressures that play themselves out using innovation as a principal weapon (Baumol 2007: 176).

Implicit in Baumol's statement is that growth is due to the human capital that is produced under a system of private property rights and free enterprise . There would be no profit motive or confidence in keeping what one earns without private property, competitive pressures require free enterprise, and innovation is a type of human capital. Thus, what Baumol seems to be saying is that the institutional conditions that we associate with the concept of a market economy give people incentives to produce human capital,

measuring these separate and possibly derivative causes. Moreover, these variables have complex relationships with other variables that have been suggested as important. In light of these facts, it is not surprising that econometricians have a fertile ground for future study. Nevertheless, I believe that the prospect of success in isolating the determining factors by means of such studies seems dim.[41]

The study of economic growth long predates the development of econometrics and macroeconomics.[42] The so-called father of modern economics, Adam Smith, entitled his 1776 book *An Inquiry Into the Nature and Causes of the Wealth of Nations*. The book was largely a treatise designed to explain why some nations are more wealthy than others. Smith's answer, broadly speaking, was the capitalist system, which gives individuals incentives to produce diversified human capital (as is implicit in the pin factory example). The expansion of markets, through international trade for example, increases these incentives.

Smith assumed what we would today call the ideal (i.e, the extreme case) of a pure market economy. By comparing the prosperity of contemporary England with its less prosperous counterparts, while noting that the counterparts were farther away from the pure market economy ideal, he aimed to "demonstrate" the relationship between what we might today call the extent of capitalism and the wealth of a nation. From a growth perspective, he would have argued that, other things equal, a nation is more likely to grow, or to grow faster, if it is more capitalistic because capitalistic institutions promote the production of specialized human capital.

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which leads to economic growth. At least, this interpretation fits the story I am telling here.

[41] As Baumol noted in 2002, "[t]here is no equation or other relationship that attempts to describe, for example, the incentive structure that leads to determination of the magnitude of [innovation]" (Baumol, 2002: 265, as reported in North: 2007: 44). I would venture to say that, while such an equation might be produced, it will be irrelevant to helping to comprehend economic growth.

[42] This fact might seem trite. However, there is a tendency among growth theorists to associate the idea that the capitalist system contains the conditions for growth with recent work by mathematical economists and econometricians. Romer, for example, defines "endogenous growth" as "a diverse body of theoretical and empirical work that emerged in the 1980s. This work distinguishes itself from neoclassical growth (Solow-Swan) by emphasizing that economic growth is an endogenous outcome of an economic system, not the result of forces that impinge from outside" (Romer 1994: 3). Romer recognizes connections between endogenous growth theory and earlier growth theory. For example, in Romer 1996 (206), he recommends dealing with scale effects like Adam Smith did: "as a *fundamental* aspect of our economic world that follows from the nonrival character of ideas" (emphasis added). He has been less concerned, however, with the "institutions" of the market economy. It is important to recognize that even in the absence of the spillover effects he describes, growth would occur in a market economy because the presence of competition would give individuals incentives to take the actions that cause it (see Chapter Six of this text). However, in the absence of the market economy, there is scarcely any reason to expect growth, regardless of its spillover effects.

Romer wrote that "[f]or a nation as a whole, an effective institutional arrangement for supporting technological advance must therefore support a high level of exploration and research in both private firms and in universities." I would emphasize that while "support" for university research may facilitate technological advance, the essential factor is that the firms be "private" in the sense that there are private property rights and free enterprise. In recent interviews (published on the internet), Romer like practically all growth theorists, has come to recognize the significance of these institutions, although one cannot be certain whether he has elevated them in importance to the stature they deserve.

A lesser known figure, Carl Menger (1871), expanded on Smith's ideas of specialization by referring to orders of knowledge that are employed to produce the resources that are used, in turn, to produce other resources, which are used to produce a consumer good (See Chapter 5). Growth, he argued, consists of increasing the number of these orders. We might roughly define Menger's orders of knowledge as the knowledge associated with forming longer and longer supply chains.

Another economist who expanded on Smith was Allyn Young. Young conceived of growth in terms of a tendency toward general equilibrium. The capitalist system, as he conceived it, contains "deeply rooted" forces "which are continually defeating the forces which make for economic equilibrium..." As a result of these forces, "change becomes progressive and propagates itself in a cumulative way." (1928: 533). Writing prior to Hayek (see below), Young did not pause to point out that the forces which make for an economic equilibrium are signaling, adjustment to change, and coordination.

Finally, for Frank Knight, the private property system and free enterprise engenders entrepreneurial investment under uncertainty. The investment leads to new knowledge – knowledge that reproduces itself so long as it is valuable (1944: 42-47). Knight differed from many modern theorists in his view that it was futile to try to predict the new knowledge that would result from investment. On the other hand, one can not fully understand the superiority of the capitalist system over socialism without recognizing the propensity of the system to generate such knowledge (Knight 1940).

Following this line of thought chronologically, albeit typically with little knowledge of it, some of the new growth theorists have pointed to the importance of (1) what we would today call human capital and (2) the conditions of the market economy. Thus, one might say that the new growth theorists have put themselves on the same exploratory trail as the early economists.

It is noteworthy that none of the early economists conceived of trying to formally model the process that leads to growth. The first two mentioned above wrote before serious modeling was attempted in economics. The latter two did not see how the process involved could be modeled and, generally speaking, regarded efforts to model as likely to lead one away from the real phenomena that lie behind growth.[43]

Why do modern economists attempt to model the causes of growth? There are two answers, it seems. First, using econometrics to test whether a model matches statistical data has become a professional norm. Thus, many economists do this because it is what other professional economists do. The origin of this set of professional norms is probably the combination of (1) the availability of aggregate data following WWII, (2) the increasing use of econometrics in macroeconomics, (3) the belief that testing hypotheses in numerical form is what economics, as a science, should be, and (4) funding by governments and private organizations in light of the post-war worries about unemployment. We discussed these factors above. Second, building a model based on knowledge of the data is a means of better organizing the data. It helps describe the relationships among the data and, to the extent that the data matches basic economic patterns of a market interaction, the complex consequences of choices. Since the data exists, organizing

[43]Young could not see how a self-propagating process could be modeled and regarded the typical equilibrium model as misleading, while Knight regarded entrepreneurial investment as an imaginative, inventive and creative process. Because of this and because much unexpected knowledge results merely from acting in an uncertain world, it is impossible to know the result in advance.

it better has some value as news and it may help with forecasting. Its value as news, in turn, may contribute to policy decisions.[44]

These models aside, the important thing for a macroeconomics textbook to teach about growth is that it entails the production of human capital that is motivated by individuals under the conditions of the market economy – i.e., under capitalist institutions.[45] To do this requires an elucidation of those institutions and the development of a market economy logic. The institutions in question are private property rights, free enterprise, and a stable money. The market economy logic concerns the incentives that people have under private property rights, the motivating aspect of competition, and how a stable money contributes to coordination. These ideas constitute the bulk of the subject matter in the early part of this text.

5. CRITIQUE OF THE NEOCLASSICAL-KEYNESIAN SYNTHESIS

Earlier I mentioned the synthesis between "Keynesian short-run analysis and neoclassical long-run analysis" (Woodford: 2003: 9). Mankiw calls this the "new" and scientific synthesis. From the standpoint of those who aim to maintain a situation as close to the status quo in macroeconomics as possible, this synthesis performs a useful function. If it is successful, the more noble conservatives of the macroeconomics profession can avoid reclassifying, as a sunk cost, the value of the time they have spent learning Keynesian and "neoclassical" macroeconomics, monetarism and a host of other things unique to professional macroeconomics. They can continue, in good conscience, to do the same kinds of peer-evaluated research based on the Keynesian macroeconomics, mathematical model-building, and econometrics that have played such a big part in their education and previous work. They can also feel that, by continuing to teach material of the same sort, they are helping the next generation of macroeconomists follow in their footsteps. Finally, the textbook writers can feel that they are helping students learn what they expected to learn about the subject.

Such macroeconomists need not deny that the policies of fiscal restraint and inflation targeting have succeeded in reducing the need for unemployment policy. They can agree that fiscal policy, as a policy tool, is completely ineffective. But they cannot abandon monetary policy. They must maintain the position that monetary policy can be an effective tool.[46] They must assert that the aim of macroeconomics is to give advice to the central bank about which quantity of money and which interest rate it should try to achieve under different circumstances.

Admittedly, modern central banks have adopted inflation targeting. However, they have not given up their discretion. Within a narrow range, the central bank retains some scope for monetary policy. Moreover, perhaps modern macroeconomists can help central bankers decide

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[44]It should be recognized, however, that the belief that growth data repeats itself is not a sound basis for making policy. The hypothesis that data repeats itself must be accompanied by a theory that is logical and reasonable.

[45]From this point of view, this text takes much inspiration from the work by Douglass North and colleagues concerning the historical evolution of institutions and their importance to wealth. See North, 2007, for a summary of this approach to economic growth.

[46]A much weaker position often heard from classroom teachers is that because monetary policy is actually carried out, it is important that economists study it. This position is weaker because it rests on the idea that macroeconomic is neither science nor engineering. As a student of what policy makers do and the reasons they give for doing it, the macroeconomist becomes an historian or sociologist.

whether a particular inflation target is optimal. If traditional macroeconomists can develop more sophisticated models and techniques of helping to predict the effects of various changes in monetary policy on unemployment, inflation, and economic growth, they will make a contribution to economic science. And, who knows, maybe they will discover some better way to conduct macroeconomic policy in general. Thus the "synthesizers" can contemplate a new synthesis-based econometric model – like those of MIT, the University of Pennsylvania, and the Federal Reserve Banks – based on a logical amalgamation of short-run Keynesian or new Keynesian ideas and the more important criticisms of these ideas that have been made in the past 40 years or so. In the meantime, the textbook writers can feel comfortable presenting the material they believe is being synthesized.

I will argue in this section that such a new synthesis cannot succeed because it has a fatal flaw. It shares this flaw with every macroeconomic model that contains a typical "money market" or "market for liquidity." These models invariably assume that the central bank can change the quantity of money without causing unspecifiable economic decision-making errors. In fact, this assumption must be false. We know this because of the signaling function of price announcements and acceptances.

The Signaling Function of Price Announcements and Acceptances

Three Obvious Facts

I begin with a fact that is obvious to everyone. It is that *individuals in the market economy engage in planning*. Not every action is planned and it is often less profitable to incur the costs entailed in planning than otherwise. Nevertheless, it is obvious that practically every actor's success as a chooser over the long term depends largely on whether and how she plans her actions.

A second obvious fact is that, in planning, individuals use knowledge. They do this because they recognize that a person who uses the "right kind" of knowledge to plan can improve the return on her actions. She can cause the benefits to be higher or the costs to be lower than otherwise.

It follows that a person can improve her success in action by using the "right kind" of knowledge. This is true for both the isolated actor and for an actor in market interaction. For the isolated actor, the knowledge is necessarily about her own wants and environment. With better knowledge about her wants and environment, she can, by her own reckoning, make better choices. Her choices are subject to error, of course. She may believe that she has enough of the right kind of knowledge yet later find out that she was wrong. In this event, her action would lead her to be worse off by her own reckoning.

In the case of market interaction, the actor uses an additional kind of knowledge. In addition to knowledge of one's wants and one's material environment, the market actor also uses knowledge of how others are likely to act in the future. It is the latter type of knowledge on which we must focus in order to understand the flaw in modern macroeconomics.

Practically everyone in market interaction knows that his own planning and actions depend on how others will act in the future. And practically everyone knows that others' planning and actions depend on their predictions about how he will act in the future. Because each person can perceive that others may gain from his actions, he has an incentive to signal others about his willingness to perform such actions in return for money. These signals reveal, to some degree, how a person is likely to act. When a baker advertises its bread, he reveals that he is likely to exchange bread for money. Similarly, when a worker applies for a job, she signals that she is likely to agree to work if offered the amount of money that she has indicated she expects to be

paid for her work. For a third example, when an employer establishes a promotion or bonus policy, he signals workers that if they perform certain actions that please the employer, they stand to gain more than if they perform action that do not please him. Finally, when a person buys a bottle of milk, she signals the possibility that she may return in the future to buy another bottle. These are cases of price signaling – signaling one's future actions by making a price announcement or accepting a price. In each case, the signals add to the knowledge used by others in their planning and choice-making. It follows that *in market interaction, decisions about which food to consume, which transport to use, which job to take, which training program to embark upon, which resources to use to produce a product, and so on depend to a very large extent on knowledge that is derived from the price announcements and acceptance of prices that others have made.*

Recognition of these facts leads us to identify a third fact that is obvious for planning in market interaction. It is that *people in market interaction use prices to signal others about what they believe to be their wants and their means of satisfying others' wants*. A corollary is that *some people use the signals of others to plan their actions*.

These are obvious facts in the sense that everyone in a market economy experiences them. Nevertheless, because each person occupies only one small position in an overwhelmingly large economy, it is not obvious that every other person in the economy experiences these same facts. In other words, it is not obvious to everyone that planning, the use of knowledge, and price signaling extend up supply chains, across chains, and into credit markets. People who buy final goods at super markets and department stores and owners of resources may be completely unaware of the rest of the signaling. Indeed, they may not even be aware that they base their own actions on the signals that others send and that their own actions provide signals to others. All they need to know is that they can use the money they earn on their jobs to buy goods that satisfy their wants. They need not care about the planning, signaling, and knowledge that enable them to have income-earning employment and to buy the goods to be in the stores from which they buy.

Planning, knowledge, and price signaling are pervasive in market interaction. In total, the knowledge and signaling used in planning are unfathomable. It is particular knowledge that, in a specialized economy, ordinarily differs from that possessed by others. It is part of what Hayek called the knowledge of "particular circumstances of time and place" (1945: 521). It is largely idiosyncratic.

Macroeconomics Disregards the Third Fact

It would be possible, through investigation, to verify that idiosyncratic knowledge is used for planning at different links in a supply chains and in other exchanges and that, at each link, individuals both (1) send price signals relating to this knowledge and (2) depend on the signals sent by others. It is probably also true that someone who has experienced the system in many of its manifestations could deduce these facts from the observation that supply chains exist and that the distinctly human beings use them in market interaction. Nevertheless, because the facts are not obvious, it is very easy to build a system of logical thought that completely neglects them. This is what practically all of the macroeconomists have done. Textbook writers use an analogous system as a basis for teaching undergraduate university students.

Signaling Function

I use the term *signaling function of prices* to refer to the net benefits that we can imagine the people of society receiving from announcing exchange offers and accepting prices. It includes the net benefits due to that actions taken by people who observe pricing behavior and use their

observations and understandings in their conscious planning. For example, it includes the net benefits from speculation on prices.

The Outcome of Knowledge, Planning and Price Signaling: "Moving in the Right Direction"

As a means of signaling, prices enable individuals to make adjustments to continually changing conditions of demand and supply. A change occurs one place in the economy and it is quickly communicated, by "a system of markets and prices," to others who are "located" at parts of the economy that are remote from the part in which the change occurred. The others then make plans and carry them out by making adjustments. Thus, the signaling function of prices entails people throughout the economy taking account of both the idiosyncratic knowledge they possess and the knowledge communicated by others that they themselves do not have. Because of the signaling function of prices, peoples' adjustment actions cause the economy to "move in the right direction," as Hayek put it (*ibid*.: 527).

The changes that occur may be small or large. And the adjustments may require a change in both "flexible prices" and "rigid prices." There is no distinction in Hayek's depiction of the price system – or in any reasonable interpretation of how adjustments in the right direction must be made – between the size or "rigidity" of prices. Prices perform their signaling function in any case.[47]

Of course, people are not perfect. They operate in a world of uncertainty. They often make errors. As a result, every communication and every adjustment cannot be counted upon to cause a move in the right direction. Our knowledge of human nature, however, leads us to expect that people will try to avoid mistakes and that they tend not to repeat the mistakes of the past. To the extent that they are successful – and we have every reason to believe that they are more likely to be successful than unsuccessful – they will cause a move in the right direction.

Compare this with what we might expect from government agents. An economist who appreciates the operation of Smith's invisible hand does not expect government agents to either know more about the "right direction" of peoples' actions than private parties or to be able to implement policies that will move the economy in the "right direction." Thus, we would rule out a priori a monetary policy that aims to move the economy in a direction that is "more right" than people in a market economy would move it.[48]

If we try to imagine all of the supply chains at once, we immediately recognize that the supply chains for different goods are interrelated. One reason is that the same resource typically has alternative uses – that is, it can be used to help produce many different goods. This fact was one

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[47]It may be important for some readers to realize that any realistic depiction of price rigidity must specify the particular prices that are rigid. It is unrealistic to develop a macro-model that assumes that all prices, even all of the prices in a large class, such as wages, are "rigid." It is also important to realize that "rigid prices" do not lose their signaling function. Finally, the behavior that causes them to exist is chosen and can be re-chosen. In other words, even "rigid prices" are re-negotiable in a market economy. And people may decide to agree on rigid prices in the expectation of renegotiating them if they have a mind to do so. Of course, it should go without saying that the existence of rigid prices may be influenced by government policy and, consequently, that a change in that policy may lead to more or less rigid prices.

[48]We disregard external effects, public goods, deceit, and fraud – as practically all models of central bank policy do. There is no denying that government agents are sometimes in a better position to know and to act correctly in the case of externalities, public goods and monopoly. But no one suggests that monetary policy be used to deal with these market failures. The subject here is whether monetary policy can be an effective tool, not whether government can succeed in improving economic welfare.

aspect of Hayek's example of tin (*ibid.*: 526). A second reason is that the production of each good requires financing and entrepreneurial talent at the level where decisions are made about the relative profitability of different lines of business. Just as signaling enables the owners of resources to move them "in the right direction as among industries," it also enable the financiers and entrepreneurs to make the decisions about which industries should be expanded and which should be contracted.

It is often not realized that to move in the "right direction" refers not only to actions that satisfy wants at a specific time but also to actions that satisfy wants throughout an indefinite future. Thus, it would ordinarily be a move in the "wrong direction" if individuals neglected their anticipated future wants and abilities. People in the market economy use a particular set of prices to help them express and account for wants and abilities through time – the rates of interest. These rates serve to indirectly remind individuals of the cost of devoting more resources to the satisfaction of wants that are either too near or too remote in time.[49]

Let us use Hayek's concept of a *structure of production* to represent the concept of a movement in the right direction. Then a movement in the right direction requires, at a minimum, that known resources be moving toward the positions in the structure of production where they are most valued, in an indirect way, by consumers. Of course, the structure of production is not a fixed structure. It is constantly changing so that the resource positions that are most valued today may not be the same as those that are most valued tomorrow.

Quantity Independence Characteristic of Money

The signaling function of prices exists no matter how much money there is. The same is true of other services that one attributes to money: the medium of exchange, unit of accounting and store of value. I call this the "quantity independence characteristic of money's services." This, one might argue, is the true lesson of the quantity theory of money. Of course, this characteristic does not apply to transitions caused by changes in the quantity of money. We now turn to that issue.

Changes in Money's Quantity Disrupts Communication

A corollary to the quantity independence characteristic is that, other things equal, a change in money's quantity disrupts the performance of money's signaling function by introducing a new factor that prompts people to give signals to which others will want make adjustments. The best way to demonstrate this is to compare a situation in which the money is not increased with one in which it is. To isolate this corollary, we employ the extreme assumption that people do not expect an increase in the quantity of money or its effects. We might suppose that the quantity of money has remained constant for a very long period of time.

We should not confuse this situation with one in which the economy is "in equilibrium" or with an economy that is fully coordinated. The usual notion of equilibrium, as it is used in macroeconomic models, conceals the signaling function of prices.[50] In the situation I have in mind, money

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[49]In his article, Hayek did not bother to develop this theme about interest rates being prices. He had introduced it earlier in a different setting (1933, 1935, 1939). The project of showing how to properly incorporate time preference and perceived abilities to satisfy wants through time into a theory of monetary policy was completed by Ludwig von Mises (1966: ch. 17-20), albeit with a style that tends to repel the modern professional economist reader.

[50]The same is true, to some degree, of the concept of a fully coordinated economy, which I use in this book, although the term coordination at least reminds us to be attentive to a "coordinating process."

is used to signal and to help people adjust to changes, but changes are continuing. Coordinating actions are a continuing part of the image of this economy and the signaling function of prices is present. The economy is always "moving in the right direction" although, to extend the analogy, "the direction in which it is moving is always changing". This situation is the same as that which I have been describing in my discussion of price signaling and the tendency toward greater coordination. The only thing to keep in mind is that we have not yet taken account of the possibility that the quantity of money might change.

A Change in the Quantity of Money

Consider an increase in the quantity of money. In the absence of an increase, the signals that individuals give correspond to perceived real wants and perceived *real* abilities to satisfy wants. But when new money is introduced, the recipients of the new money obtain a means of signaling that they otherwise would not have had. The increase in money alters the nature of the signaling from what it otherwise would have been. What would otherwise have been the perceived real signals are distorted and the communication of perceived real signals is disrupted. Within this general framework, we identify two classes of likely distortions: (1) distortions due to transactions costs and (2) distortions due to price changes caused by the new money. Within the second class, I discuss two types: (a) ordinary distortions due to illusions and errors and (b) distortions relating to projects with high startup costs.

Distortions Due to Transactions Costs

A typical business lending situation requires a matching of a producing entrepreneur, a guarantor, and an ultimate lender. The matching requires intermediation services and the intermediaries must be rewarded. Intermediation is necessary for all loans, of course, since ultimate lenders seldom have the idiosyncratic knowledge they would need to evaluate the borrowing prospects of ultimate borrowers. Loans involving the additional money require additional intermediation. We show below, however, that the new loans distort price signals and, as a result, reduce the abilities of entrepreneurs to efficiently satisfy consumer wants. It follows from this that the additional resources used for intermediation are also unnecessary. Because the additional intermediation services are provided only because of the increase in money, the increase in money causes a distortion of resource use away from the satisfaction of consumer wants.

Distortions Due to Illusions and Errors

To understand the distortions due to illusions and errors, we turn to the money that gets into the ultimate borrowers. Under market economy conditions, these borrowers offer the best profit opportunities, in the eyes of the combination of bankers, financial intermediaries involved, and guarantors who effectuate the borrowing.

It is possible that the new money would be borrowed to finance consumption. In the extreme, the highest ranking borrowers may all be interested financing holiday travel, which they aim to pay for with their future income. In this case, the new bank money will cause suppliers of travel services to bid resources away from other uses. On the other hand, it may all be borrowed by entrepreneurs to carry out production projects. In this case, the money will cause these entrepreneurs to bid resources away from elsewhere in order to carry out the projects. Or the money may be borrowed by some combination of consumers and entrepreneurs.[51] Whoever

[51]It is essential to realize that the additional money is perceived as an addition to what we might roughly refer to as a guaranty fund. A guaranty fund is an non-calculable yet real sum of wealth that risk-

borrows will bid up the prices of the resources that they use or that are used to supply their demands immediately. These prices will be the first to rise. As a result, resources will shift toward meeting the demands of the ultimate borrowers. Entrepreneurs who would have used these now higher-priced resources will bid up resource prices in secondary resource markets. The prices of resources in secondary, tertiary, etc. resource markets will begin to rise. The entrepreneurs who use these resources would ordinarily respond by reducing production and raising prices. However, the higher resources prices are also accompanied by higher prices for consumer goods.

As the new money is received by the suppliers of the higher-priced resources, they use it to buy consumer goods or to save, with the saving ultimately replenishing the loanable funds. The items or services for which they bid will now rise in price. As time passes, all markets for goods and resources will be affected. However, the precise pattern of effects depends on the specific demands of the people who receive higher incomes at various times and on the idiosyncratic knowledge of the entrepreneurs who bid for resources at various times and on the knowledge acquired through price signaling.

Since no one initially knows that future consumer goods' and resource prices will rise due to the increase in money, knowledge about these higher prices must be acquired in a piecemeal fashion by each separate market participant. Because of this, it is practically impossible that price signals will transmit knowledge about perceived real wants and perceived real abilities as effectively as it would do so in the absence of the increase in money. In short, the kind of knowledge that enables the economy to move in the right direction is bound to be distorted. On the contrary, we have every reason to believe that, until people start to realize that prices, in general, have risen, their decisions will be erroneous. Because the increase in money is totally unexpected, we know that, at first, the prices only partly reflect what market participants perceive to be their true demands and true ability to satisfy them. As a result, we can deduce that most market participants will regard their planning and decisions as errors.

The introduction of new money necessarily has distribution effects and is likely to cause new human capital to be produced. Because the new money is introduced in a particular way, some people will benefit and others will be harmed. Some may be in a position to gain from the higher prices they face while others may be in a position were losses are unavoidable.

Exactly what the distribution effects or effects of new knowledge will be cannot be known by policy makers. We must account for these effects, however, because they change what market

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averse ultimate creditors believe backs up promises made by borrowers to repay loans. Properly understood, it is not an addition to the funds available for carrying out investments. A perceived addition to the guaranty fund leads ultimate lenders (banks) to make more money available to borrowers. But whether the borrowers use the money to finance short term consumption, long-term investment, or other activities or projects cannot be determined a priori.

An error in the Austrian theory of the trade cycle, as presented in its final version by Mises (1966,Chapter 20) and in an earlier form by Hayek (1933) is the failure to recognize this fact. The central bank's injection of new money does not necessarily lead businesses to carry out production projects with a longer average length than otherwise, although it may. People who feel that they are supported by more guaranty may increase lending for a variety of purposes. The reason for a cycle is that there is no real increase in guaranty. When this fact is ultimately discovered as the result of business failures due to communication and planning errors, the mis-perception starts to be corrected. To be sure, there are "malinvestments." And the term malinvestment is more descriptive that the term "overinvestment." But the malinvestments need not be in the production of goods for the more distant future.

Of course, the Austrians of Mises's generation, must be credited with maintaining a consistent recognition of the signaling function of prices. And the younger Austrians must be credited with not being swayed by a macroeconomics that ignored this function.

participants perceive to be their true demands and true abilities to satisfy them. In simple terms, the distribution effects alter the "right direction." What would have been the right direction for resources to follow in order to best satisfy consumer wants changes.

Thus, there are two reasons for error. The first are the new prices which could not have played a role in previous planning. The second are distribution effects. Many consumers will say that they did not expect the prices of consumer goods to be as high as they turned out to be. Many resource suppliers will say that they did not expect their incomes to rise. Many entrepreneurs will say that they did not expect the prices of the goods or resources they sell to be so high, the costs of producing them to be so high, or the cost of borrowing to be so low.[52]

For economists who are accustomed to thinking in terms of aggregates, it is essential to realize that the price effects of the new money are in no sense uniform throughout the economy. Each person is affected in a different way. Each wage is affected differently because of both idiosyncratic knowledge and because each unit of work (which consists of a labor and human capital component) is different from every other. Similarly, different consumers consume different goods. All that we can safely deduce is that the new money will cause prices and incomes, *as a whole,* to rise, that it will increase the number of errors, and that the errors due to the new money would gradually decline.

The introduction of new money also affects human capital production. Some new human capital will be deliberately produced by means of R&D projects. Since decisions to carry out such projects are not likely to lead in the right direction in the early stages, many more are likely to be regretted than if the quantity of money had not been raised..The uncertainty involved in all production implies that new technical knowledge is likely to be acquired as a result of new production. This new knowledge is typically regarded as a byproduct of investment since its recipient does not and cannot plan for it. However, new production comes at the expense of production that would otherwise have occurred. As a result, whether the real value of this new byproduct knowledge is greater than the value of the byproduct knowledge that would otherwise have been produced cannot be known. To the extent that new R&D is carried out, this also will raise the level of some types of technical knowledge. However, the decisions that led some of the R&D to be carried out will be regarded as erroneous. Again, there is no way to tell whether new technical knowledge will rise or fall in relation to what it would have been if there had been no increase in the quantity of money.

Errors in Deciding Projects With High Startup Costs

Projects with high startup costs may be long-term projects or they may be relatively short-term upgrading projects. Upgrading may be desired in order to replace deteriorated capital goods or in order to copy a new method of production. The profitability of upgrading depends partly on the interest rate.

Errors made in such projects cannot be corrected. The investments in them will be regarded as sunk costs. The only question that an entrepreneur will regard as relevant after he realizes he made

[52]It may be worth emphasizing to those who are used to thinking of errors in statistical terms that there is no sense in which it can be argued that the errors made by different actors will cancel out. Each person's decision is made on the basis of idiosyncratic knowledge, often in idiosyncratic transactions, that is not knowable to an outsider. Although one might represent a specific error by means of a model of decision-making that contains an error term, it is not permissible to statistically aggregate specific errors due to the assumption of idiosyncratic knowledge and transactions. For the same reason, there is no reason to expect that errors would follow a predictable time path, except in the rough sense that we can assume that everyone would have a propensity to avoid repeating past errors.

an error is whether the expected revenue is sufficient to cover *additional* costs. If it is not sufficient, the entrepreneurs will abandon such projects and regard them as malinvestments. Precisely what these errors will be cannot be easily determined.

Conclusion

So long as the quantity of money stays the same, the signals people send and the adjustments they make will tend to lead entrepreneurs to make choices that cause a move in the right direction. An increase in the quantity of money implies that the prices will be distorted by a force that has nothing to do with the perceived real wants and abilities to satisfy them, which cause people to communicate, plan and make decisions to adjust in market interaction. The allocation of this money to borrowers who are regarded as the best prospects by lenders requires additional resources. In addition, its spending by the borrowers distorts prices and causes decision-making errors. It leads to distribution effects, which are another source of decision-making errors, and it is likely to lead to resource waste due to the abandonment of some projects with high startup costs. These conclusions become evident when one takes account of the signaling function of prices.

The Fatal Flaw of the Synthesis

Woodford justifies his book on the above-mentioned synthesis by saying that central banks need a way to decide how to best target inflation. We have shown here that insofar as inflation targeting requires an unexpected change in the quantity of money – and I cannot think of any other way for a central bank to achieve this goal – the change will reduce the effectiveness with which money performs its signaling function. The only conclusion that is sensible to reach is that the so-called new "scientific syntheses" cannot achieve the goal that it aims to achieve. Its approach is flawed at the outset. Fiscal policy to "control" short-term fluctuations died in the 1970s and monetary policy that aims to achieve the same goal ought to be euthanized today.

The deficiency in Woodford's syntheses is present, of course, in a much broader set of models than the one he proposes. It is also present in the basic IS-LM model and the derivative AD-AS models that have been the workhorses of professional macroeconomists and macroeconomics teachers, respectively, since shortly after they were invented.

A Defense of Discretionary Monetary Policy?

For the purpose of this discussion I define discretionary monetary policy strictly. It refers to any policy that changes the quantity of money from what it currently is. A common defense of discretionary expansionary monetary policy is that, although it has costs in terms of future expected inflation, it also has benefits and that the benefits often outweigh the costs. In this framework, the disruption of the signaling function would be regarded as a cost.

This argument must be handled at two levels. At the first level, it must be admitted that there is one obvious circumstance in which the benefits of discretionary monetary policy may be so great that they overwhelm all costs. This is the case of a reaction to another change in the quantity that has occurred in the immediate past. During the Great Depression, the quantity of money fell rapidly mainly because of bank failures. The benefits of quick action to prevent the distortions due to the money quantity decrease would have been very high. The distortion caused by the fall in money quantity could have been largely avoided. It is difficult to say whether actions to restore a bank to solvency after it had failed would have been wise. The answer depends, in part, on how long a period of time had passed. If the restoration occurred quickly, perhaps further errors could have been avoided. But it is certainly wrong to assume, carte blanche, that the earlier quantity of money was an optimum.

Another example is that of increases in base money if base money creation controlled by the government and not by the central bank. The central bank could react to an increase in base money by tightening the money creation powers of banks.

Both of these examples are of compensatory actions and they involve money that is partly outside the central bank's control. To fully evaluate a defense of monetary policy at this level, one would have to have a detailed specification of the alternatives. For example, the best alternatives may involve a change in the laws regulating contracts between bankers and depositors. Another might be the requirement of 100% reserves in gold. Still another might be to take money-creating powers away from the government.

This first level of discussion raises the issue of whether, under a current system of relatively tight central bank control, a means might be found to change the quantity of money that is outside that control and whether a change in the latter quantity might be offset by a change in the quantity controlled by the central bank. I regard this issue as beyond the scope of this inquiry.

The second level pertains to less extreme cases. An example is the recent inability of mortgage borrowers to meet the required payments on creative and sometimes deceptive loan packages. An interesting twist on this case is that the promoters of the loan packages used price signals that deceived borrowers (or created illusions among borrowers). An important distinction between this case and the previous one is that the failure to pay off loans did not reduce the quantity of money. The monetary policy recommendation, however, was to increase the quantity of money, albeit to a small degree. It seems evident, however, that the policy tool does not fit the problem that it aims to solve. The problem is that the housing and related industries expanded too far. Their managers took actions that led to a move in the wrong direction. The loan defaults provided signals of this fact and, after the signals were given, people began to take actions to move the economy in the right direction. One of those was unemployment in the housing industry. An increase in the quantity of money would not affect that movement any more than it would affect other coordinating actions. But it would distort the signaling process and, as a result, introduce transactions costs and cause many actions that would otherwise have been coordinating to become discoordinating. A likely effect is a mild boom followed by a mild recession, since the quantity of money would presumably not be increased by very much. It is possible that such effects would be partly concealed by other changes, such as the greater coordination in the housing and related industries.

The proper policy response, if one is needed, relates to the price communication in the market for housing mortgages. The government could collect information on past foreclosures and mortgage packages and distribute it to prospective home buyers. As opposed to this, it might be argued that the necessary movement in the right direction requires that entrepreneurs discover ways to protect home buyers and other long term purchasers from deceptive information. An example would be the emergence of institutions that independently grade mortgage loans or packages of mortgage loans. Government intervention may block this move.

Related Issues

In this subsection I consider two related issues: the money illusion and why inflation targeting has "worked." I discuss each in turn.

The Money Illusion

The literature in macroeconomics contains one clear example of the recognition of errors due to the failure of prices to perform the signaling function efficiently – the money illusion. In one of the most prestigious journals in economics, Shafir et. al. (1997: 341) define this as "a tendency to think in terms of nominal rather than real monetary values." This definition should raise a red

flag to the reader who has followed my argument in this section. How can anyone (besides an economist who aims to describe the quantity independence characteristic of money) think in real monetary values? What Shafir et. al. seem to have in mind is that actors in the market economy may not use the actual prices they face to make calculations about what economists know or can hypothesize to be the real (i.e., the relative) prices. One is at pains to imagine how actors could think in any other way but in terms of monetary values. The authors offer a suggestion. They suggest that the "[m]oney illusion... arises in large part because it is considerably easier and more natural to think in nominal rather than in real terms. This tendency, we suspect, is likely to persist despite economists' attempts to educate the public..."(Shafir et.al. 1997: 367). How could economists educate people in market interaction to not use price signals?

With the above discussion in mind, one must regard Shafir's et. al.'s remarks on the money illusion as bordering on the ridiculous. Yet their discussion reflects a very real tendency among mainstream macroeconomists to take market coordination for granted. Economists who have this tendency need to pause to work out the implications of Hayek's example of tin, which we cited above.

Prices could not perform the signaling function if people did not come to rely on the signals as reflecting the real wants and real willingness and ability to satisfy wants. The change in money affects the signaling function of prices. It does not introduce a bias into decisions-making.

I can make a similar comment about Fehr and Tyran's 2001effort to use experimental evidence of a money illusion to demonstrate that it is significant. This paper appears in the most prestigious professional economics journal. In their introduction, the authors write about the opinions of other economists on the money illusion. They say that "[u]ntil recently, the notion of money illusion seemed to be thoroughly discredited in modern economics" (2001: 1239). They cite several references and then support the idea that the money illusion is important by noting that it could help to explain "the inertia of nominal prices and wages and, thus...the nonneutrality of money." They go on to suggest that modern economics rejected the money illusion because such phenomena cannot be easily incorporated into "an equilibrium model with maximizing individuals" (*ibid*.).

Illusions and decision-making errors could never be incorporated into such models. The function of prices is to provide the signaling that enables the adjustments that lead coordination in a market economy to occur. If one assumes that coordination has already occurred, which equilibrium theorists do by definition, there can be no signaling function of prices. If these comments by Fehr and Tyran truly represent the view of "modern economics" toward the money illusion (and the errors to which it leads), then modern economists must have lost their way. Presumably, the ultimate goal of such economics is economic policy. But equilibrium models that do not include the signaling function for prices surely miss the only channel through which changes in the quantity of money affect economic interaction.

Of course, inertia, if that is really what they mean, plays no role in price signaling. And in light of the discussion above, it is hardly necessary to search for any other reasons why a change in the quantity of money affects real decisions besides errors caused by new money.

Why Inflation Targeting "Works"

Inflation targeting "works" to help provide an environment for economic growth and international trade because it reduces the variation in the quantity of money caused by any kind of discretionary monetary policy. Any one of the plethora of monetary rules helps because it is virtually impossible to keep such a rule secret even if a central bank wanted to. As a result, people can, to some degree, prepare for the next injection or extraction of base money from the economy. But none of theses rules and no discretionary monetary policy that changes the quantity of money

(and presumably changing the quantity of money is the reason why monetary policy exists) can be carried out without diminishing the ability of money to provide the foundation for the operation of the signaling function of prices.

A predictable increase in the quantity of money is something like a redistributive tax that is costlessly administered. If it is expected and small enough, people will adjust. But what is the point of it? Surely a central bank's mandate does not include creating additional profit opportunities for astute bankers, financial intermediaries and guarantors at the greater expense of the people who hold money because no trustworthy person or business will guarantee that their promises to pay money will be kept. And surely it does not include introducing a source of error that would otherwise be absent.

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