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Readings in MONEY, NATIONAL INCOME, AND STABILIZATION POLICY

Edited by

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PREFACE

This new edition of *Readings in Money, National Income, and Stabilization Policy* reflects the same approach and viewpoint and is organized in the same way as the edition it supplants. However, many of the readings in the previous edition have been replaced with new, up-to-date material. Chapter 6, on international finance, is entirely new, and the chapter introduction has been expanded considerably in order to link the readings in the chapter to the general theoretical framework which is laid out in the introduction to Chapter 1. There also are substantial changes in the content of the other chapters, especially in the material on inflation and unemployment (Chapter 1, Section B) and on fiscal policy (Chapter 4). Overall, well over half of the readings in this fourth edition are new.

This fourth edition, like its predecessors, has been designed for supplementary use in courses in monetary economics, national income analysis, business cycles, and stabilization policy. Its contents reflect the editor's belief that in such courses a structural framework should be developed which enables the student to understand the mechanisms and linkages through which both monetary and fiscal policy produce their effects on income, employment, the price level, the rate of growth, and so on. To that end, these readings were selected to supplement the available textbooks on such topics as the relationship between monetary changes and changes in output, employment, and income; and the ways in which monetary and fiscal policy are related in their joint capacity as instruments of stabilization policy. Relatively few pages are devoted to material on the institutional details of the money and capital markets, the mechanics of treasury operations, and similar topics. Such subjects are well covered in most textbooks, and a good deal of supplementary reading material of this type can be obtained free of charge from the Federal Reserve System and other sources.

Thus, most of the book is devoted to aspects of monetary and fiscal policy in the context of the theory of income determination. The selection of readings reflects the editor's "view of the world"—a view which is accepted, by and large, by a great many economists, though not all. Variations from and alternatives to

this point of view appear in many of the readings; however, most were selected to serve as "building blocks" for the development of the particular approach used, which is set forth in the rather extensive introductory material that precedes each of the chapters. These introductory sections also serve to relate the readings within each chapter to one another. The general viewpoint presented is consistent with the post-Keynesian posture of modern macroeconomics. In terms of stabilization policy, the readings are selected to show that the goal of full employment with reasonable price stability can best be pursued through the active use of flexible fiscal policy, supplemented by the use of monetary policy to achieve the desired balance between consumption and investment. Under a flexible exchange rate system of the kind now evolving, the authorities have considerable latitude to use the stabilization instruments in pursuit of domestic policy goals; but it is recognized that both fiscal and monetary instruments should occasionally be used to offset the effects on the domestic economy of impulses originating abroad.

In addition to the criteria mentioned above, the readings are selected to be comprehensible to typical advanced undergraduate students, and to be interesting to such students. Readability at this level was a major criterion in the choice of material, and the introductions to each chapter should be a substantial help

to the student in the development and integration of ideas.

The first three editions of this book bore the name of my former colleague and friend Warren L. Smith, who died in 1972 during preparation of the third edition. It was thought inappropriate to continue to list Warren Smith as coeditor of this new edition. But though his name no longer appears on the cover, the book continues to reflect strongly the influence of his wisdom, judgment, and broad experience.

The preparation of this edition has been made possible by the help and cooperation of a number of people. Thanks are due to the authors and original publishers of the selections in this book for permission to use them, with special appreciation to Robert S. Holbrook and Henry C. Wallich for allowing the use of original material that has not been published elsewhere. The preparation of the manuscript was greatly facilitated by the help of Phyllis Romo.

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Chapter

THE THEORY OF INCOME DETERMINATION

The readings in this chapter are divided into two parts. Those in the first part deal with the determination of aggregate income, employment, and prices and the propagation of income changes, with special reference to the way in which fiscal and monetary policies may influence aggregate demand. The readings in the second part deal with the question of the inflationary process, its measurement and costs, and its relationship to employment.

A. Monetary and Fiscal Policies and Aggregate Demand

It is important for the student beginning the study of national income and money and banking to develop an integrated framework which can be used effectively to analyze the problems and issues that arise. It is best to get this framework at the start so that the relevant institutional material can be fitted into it as study progresses. It is our hope that the material presented in this introduction, together with the readings contained in this section, will help the student to develop such a framework of analysis.

Economic reality is exceedingly complex, involving the outputs and prices of thousands of goods and services, the wages of thousands of different kinds of labor, and so on. The economist who tried to deal with all of the vast multitude of variables and relationships involved would soon become hopelessly bogged down. The only way to make headway, therefore, is to work with "models" which abstract from most of the detail and focus on the important variables related to the issue at hand. Of course, the model to be used depends on the kind of problem being dealt with. The models we shall develop have proved to be useful in analyzing the forces determining many of the major variables relating to the economy as a whole: the level of national income and employ-

ment, the general level of prices, and so forth. While we shall attempt to keep the models relatively simple, we feel that they represent the major economic relationships sufficiently well to enable the student who has a thorough grasp of them to comprehend and analyze many important issues of economic policy. It should be pointed out that there has been much statistical testing of models which, while more detailed and complex than those presented here, are of essentially the same character; and the statistical testing suggests that they explain the behavior of the economy quite well. Indeed, the results of some of the statistical studies are presented in readings included in this book.

We shall begin with the simplest kind of Keynesian static multiplier model of income determination with which the student is almost surely familiar from his other reading. Then we shall proceed to introduce fiscal and monetary elements in a way which, we hope, will help the student to understand questions of economic policy. We shall use an algebraic and arithmetic approach for the most part; however, the algebra does not extend beyond that covered in a course that would be taken in high school, or at the most in the first year of college. We shall also stick to linear relationships—that is, relationships that appear as straight lines when plotted graphically. Linear relationships are often reasonably good approximations to reality; moreover, the gain in simplicity of presentation is great.

Throughout the present discussion, no attention is paid to changes in the price level; in effect, we shall be assuming that prices (and wages) are unchanged and that changes in the money values of variables are paralleled by changes in their real values. However, the analysis is broadened in the first reading in this section—the paper by Robert S. Holbrook—which treats prices and wages as variables which are determined by the interplay of economic forces as are income, employment, and so on.

The presentation in this introduction is divided into two major parts. The first deals with static analysis—that is, it is merely designed to tell what will ultimately happen to the variables when some change is introduced into the model, without making any effort to describe the time paths followed by the variables in the process of adjustment. The second part introduces some quite elementary dynamics.

1. STATIC ANALYSIS

Model I: The Simple Keynesian Multiplier

This model is represented by the following three algebraic equations:

$$C = C_o + cY$$
 (consumption function) (1.1)

$$I = I_o$$
 (investment relationship) (1.2)

$$Y = C + I$$
 (equilibrium condition) (1.3)

Here C is consumption expenditure planned by households, I is investment expenditure planned by firms, and Y is gross national product (GNP). The subscript o indicates that the variable is not explained within the model but is determined by outside forces. In this model C_o stands for the amount of consumption which is unrelated to income, and c is the marginal propensity to consume (MPC), assumed to be a positive fraction between zero and unity in value. By substituting the expressions for C and C is the quantity equations (1.1) and (1.2) into equation (1.3), we obtain the following:

$$Y = cY + C_o + I_o. ag{1.4}$$

When this is solved for Y, the following result is obtained:

$$Y = \frac{1}{1 - c} (C_o + I_o). \tag{1.5}$$

If there is a change in C_o or I_o , income and consumption will also change. Suppose that investment spending rises to a new level, $I_o + \Delta I_o$, and remains there. Then we will find that income will also change by some amount, ΔY , so that the new level of income may be expressed as follows:

$$Y + \Delta Y = \frac{1}{1 - c} (C_o + I_o) + \frac{1}{1 - c} \Delta I_o. \tag{1.6}$$

Subtraction of (1.5) from (1.6) results in the following expression for the change of income (from the former equilibrium position to the new equilibrium) due to the change in investment spending:

$$\Delta Y = \frac{1}{1 - c} \, \Delta I_o. \tag{1.7}$$

Since ΔI_o is multiplied by the term 1/(1-c) to obtain the income change, ΔY, this term is called the "multiplier." This is the standard textbook "formula" expressed in the statement, "the multiplier equals 1/(1 - MPC)." The student should not, however, view it as a formula to be memorized but rather as a relationship which summarizes a complex pattern of economic behavior, a pattern to be thought through and understood. It is particularly important to realize that the multiplier expression changes as the details of the model change, and that in the real world the multiplier process cannot be summarized in as simple a formula as that shown above. We shall now make the model, and the multiplier expression, somewhat more realistic.

Model II: The Introduction of Fiscal Policy

One of the most serious shortcomings of the simple model just discussed is that no allowance is made for the activities of government. To correct this defect we shall introduce government expenditures and taxation. For simplicity, we shall assume that all taxes are levied on households and that consumption depends on disposable income—that is, income after taxes. The new model is expressed in the following equations:

$$Y_d = Y - T \tag{2.2}$$

$$T = T^* + xY 0 < x < 1 (2.3)$$

$$I = I_o$$
 (2.4)
 $G = G^*$ (2.5)

$$G = G^* \tag{2.5}$$

Y = C + I + G(2.6)

In this and following models, as was the case above, the subscript o identifies variables which are determined by forces outside of the model and which cannot be controlled by the government for policy purposes. We now introduce a second category of variables determined outside of the model: those which are manipulable by the authorities. Such variables are sometimes called "policy instruments" and will be denoted by an asterisk (*) throughout the remainder of this discussion. In Model II, government spending for goods and services (G^*) and that part of tax collections which is unrelated to income (T^*) are policy 4

instruments. The equation $G = G^{\circ}$ states that the entire amount of government spending is determined outside of the model, while the equation describing tax collections, equation (2.3), indicates that only a part of total collections is under the direct control of the fiscal authorities. T is total collections, and it is composed of T° , the level set by the authorities, plus xY, the part related to the level of income. The coefficient x is the marginal propensity of the public to pay taxes out of GNP. Finally, Y_d is disposable income (i.e., household income after taxes); and c is the marginal propensity to consume out of disposable income.

Upon substitution of equation (2.2) and (2.3) into (2.1), the following equation is obtained:

$$C = C_{\circ} - cT^* + c(1-x)Y. \tag{2.7}$$

Then, equations (2.4), (2.5), and (2.7) can be substituted into equation (2.6) to obtain

$$Y = C_o - cT^* + c(1-x)Y + I_o + G^*.$$
(2.8)

Solving this equation explicitly for Y, we obtain

$$Y = \frac{1}{1 - c(1 - x)} \left[C_o - cT^* + I_o + G^* \right]. \tag{2.9}$$

Suppose now that government purchases of goods and services are increased from G^* to $G^* + \Delta G^*$. The new equilibrium income will be given by

$$Y + \Delta Y = \frac{1}{1 - c(1 - x)} \left[C_o - cT^* + I_o + G^* + \Delta G^* \right]. \tag{2.10}$$

Subtracting (2.9) from (2.10) and dividing through by ΔG^* , we obtain the multiplier applicable to government purchases:

$$\frac{\Delta Y}{\Delta G^*} = \frac{1}{1 - c(1 - x)} \tag{2.11}$$

Multipliers could also be computed for independent changes in investment (ΔI_o) , in the level of consumption (ΔC_o) , or in the level of taxes (ΔT^*) . The first two of these multipliers would be the same as that for a change in government purchases while the multiplier for a change in taxes would be

$$\frac{\Delta Y}{\Delta T^*} = \frac{-c}{1 - c(1 - x)} \cdot$$

This last multiplier is negative, because an increase in taxes would lower disposable income, reduce consumption, and lead to a decline in income.

There is a final technical point which should be noted. So far, all of the multipliers we have discussed have summarized the effects on GNP of a change in one of the variables determined by forces outside the model. The multiplier concept is more general than this, however, and it is possible to derive a multiplier expression which summarizes the effect of a shift in any of these variables on any variable determined within the model. Thus, for example, the effects

¹ Strictly speaking x as well as T° should be regarded as a policy instrument, since changes in tax legislation could (and, in practice, usually would) change the slope as well as the level of the tax function. In the interest of simplicity, however, we are confining our analysis to changes in the level of taxes (T°) .

on total tax collections (ΔT) of a shift in the level of the consumption function (ΔC_o) can easily be derived. From the tax function (2.3) we note that

$$\frac{\Delta T}{\Delta C_o} = x \, \frac{\Delta Y}{\Delta C_o} \, \cdot$$

Using the approach employed in deriving the multiplier $\frac{\Delta Y}{\Delta G^*}$ above, we find that

$$\frac{\Delta Y}{\Delta C_o} = \frac{1}{1 - c(1 - x)} \cdot$$

It follows directly that

$$\frac{\Delta T}{\Delta C_o} = \frac{x}{1 - c(1 - x)} \cdot$$

As a general rule, it is possible to derive multipliers showing the effects on any of the variables determined by the model (the variables Y, Y_d , T, C, I, and G in this case) of a change in any of the variables which are set by outside forces $(C_o, I_o, T^{\bullet}, \text{ and } G^{\bullet} \text{ here})$.

A numerical example may be helpful at this point. Suppose the marginal propensity to consume out of disposable income is 75 percent (c=.75) while the tax system is such that taxes tend to increase by 20 percent of any rise in GNP (x=.2). Suppose further that $C_o=110$, $T^{\circ}=-80$, $I_o=300$, and $G^{\circ}=330$ (amounts expressed in billions of dollars). In this case the equations (2.1) to (2.6) become:

$$C = 110 + .75Y_d$$

 $Y_d = Y - T$
 $T = -80 + .2Y$
 $I = 300$
 $G = 330$
 $Y = C + I + G$

The multiplier relating changes in GNP to changes in government purchases (or investment, or autonomous changes in consumption) is

$$\frac{\Delta Y}{\Delta G^*} = \frac{1}{1 - c(1 - x)} = \frac{1}{1 - .75(1 - .2)} = 2.5,$$

and equilibrium, calculated from (2.9), is

$$Y = 2.5[800]$$
, or $Y = $2,000$ billion.

The values of all the variables, which can easily be calculated from the above equations, are given in the first ("original equilibrium") column of Table 1. Two additional variables, not referred to earlier, are shown in the table: private saving and the government deficit. Private saving is simply the difference between disposable income and consumption and amounts to \$310 billion. The government deficit (expenditures minus taxes) is \$10 billion. It may be noted that private saving (\$310 billion) plus the government surplus (-\$10 billion) is equal to investment (\$300 billion). This is the equivalent of the well-known proposition that "saving must equal investment" for an economy containing a government sector but no foreign sector.

Now suppose government purchases of goods and services increase by \$20 billion to a new annual level of \$350 billion, and remain there. Since the multi-

plier for government purchases is 2.5, income will rise by \$50 billion to a new equilibrium value of \$2,050 billion. The new values of all variables are shown in the second ("new equilibrium") column of Table 1, and the changes from the original position are shown in the last column.

The new equilibrium will not, of course, be reached immediately. The movement of GNP and its components to the new level involves a complex and time-consuming set of economic adjustments. The chain starts when the increased government purchases stimulate production and employment, which adds directly to GNP. Incomes are raised; a portion of the additional income, 20 percent in this case, is paid over the government in taxes; of the remaining 80 percent, 25 percent is saved, and the other 75 percent—which amounts to 60 percent (75 percent of 80 percent) of the rise in GNP—is spent on consumption, thereby stimulating further production and employment in industries producing consumer goods. The process continues through repeated "rounds" of spending and respending until GNP has been raised by \$50 billion (the multi-

Table 1:	Numerical	Example	of	Multiplier	for	Government	Expenditures	in	Model	П	(in
\$ billions)											

	Original quilibrium	New Equilibrium*	Change
Gross national product (Y)	1,370	\$2,050 1,400	+\$50 + 30
Investment (I)	330	300 350 330	+ 20 + 10
Taxes (T)	1,680	1,720 320	+ 40 + 10
Government deficit $(G - T)$		20	+ 10

^{*} After an Increase of \$20 billion in the rate of government purchases.

plier of 2.5 times the initial increase of \$20 billion in government purchases). The time lags and the speed with which the adjustment to the new level of GNP can be expected to take place are discussed below.

A reduction in the level of taxation—that is, a change in T^* —would also raise GNP. In this case, if c = .75 and x = .2, we have, as indicated earlier,

$$\frac{\Delta Y}{\Delta T^*} = \frac{-c}{1 - c(1 - x)} = \frac{-.75}{1 - .75(1 - .2)} = -1.875.$$

Thus a cut in taxes of \$20 billion ($\Delta T^* = -20$) would raise GNP by \$37.5 billion. The multiplier applicable to a tax cut is smaller in absolute value (1.875) than that applicable to an increase in government purchases (2.5). The reason is that the entire increase in government purchases is a direct increase in GNP, while a portion of the tax cut is saved, and only the part that is spent on consumption (75 percent in this case) adds to GNP. It is suggested that the student work out a table similar to Table 1 above to illustrate the effects on income and the other variables determined within the model of a tax cut of \$20 billion.

Model II illustrates in a simple way the rationale for the use of fiscal policy—changes in government expenditures and taxes—to regulate aggregate demand for goods and services in the interest of full employment and price stability. This subject is taken up in considerable detail in Chapter 4. The model used in this illustration is substantially oversimplified. In practice, for example,

not all taxes are levied on households—there are direct and indirect taxes on business as well—and some saving is done by businesses as well as by households. Despite the added complexities, however, the multiplier of 2.5 for government purchases that we used above is fairly realistic. Estimates obtained by sophisticated statistical techniques applied to much more complicated models have fairly consistently turned out to be in this neighborhood.

Model III: The Introduction of Money and Interest

The student will no doubt have noticed that we have not yet mentioned money or interest rates. It is now time to remedy this deficiency in our analysis. The essence of the problem can be handled quite well and without greatly complicating the presentation by adding additional variables and equations to Model II. The resulting Model III, which takes account of money and interest, includes the following equations, five of which (the first three and the fifth and sixth) are exactly the same as those of Model II.

$$C = C_o + cY_d$$

$$Y_d = Y - T$$

$$T = T^* + xY$$

$$I = I_o - vr$$

$$G = G^*$$

$$Y = C + I + G$$

$$M_d = M_o + kY - mr$$

$$M_s = M^*$$

$$M_d = M_s$$
(3.1)
(3.2)
(3.2)
(3.2)
(3.3)
(3.4)
(3.5)
(3.6)
(3.6)
(3.7)
(3.6)
(3.7)
(3.8)
(3.9)

Here, r is the interest rate (there is assumed to be only one interest rate). v is the slope of the investment function with respect to the interest rate, or, in Keynesian terminology, the slope of the marginal efficiency of capital (or investment) schedule. v is assumed to be greater than zero, but it carries a negative sign in the investment function—i.e., the lower the interest rate the more investment. M_d is the quantity (stock) of money (demand deposits and currency) demanded by the public and is assumed to be related positively to income and negatively to the interest rate. k is the number of dollars by which the public will desire to increase its money holdings per dollar increase in GNP (i.e., the slope of the money demand function with respect to income). k is, of course, positive—i.e., the higher the level of income the more money the public will want to hold (at a given interest rate). m is the slope of the demand for money function with respect to the interest rate. m is assumed greater than zero, but it carries a negative sign in the money demand function-i.e., the lower the interest rate, the more money the public will want to hold (at a given income). Mo is the amount of money demanded without regard to income or the rate of interest; its level is determined by forces outside of the model. M_s is the supply of money; it is equal to a constant, M^* , which can be changed at will by the monetary authorities (e.g., the Federal Reserve System) through actions such as open market operations, changes in the discount rate, or changes in the reserve requirements of the banks.

Model III is changed from Model II by introducing the interest rate into the investment equation (3.4) and by introducing three new equations, (3.7), (3.8), and (3.9), to represent the "monetary sector" of the economy. Equation (3.9) is an equilibrium condition which says that the demand for money must be equal to the supply of money in order for an equilibrium to exist.

Substituting (3.2) and (3.3) into (3.1), we obtain

$$C = C_o - cT^* + c(1-x)Y. (3.10)$$

Then, substituting (3.4), (3.5), and (3.10) into (3.6), we obtain

$$Y = C_o - cT^* + c(1-x)Y + I_o - vr + G^*, \tag{3.11}$$

or, solving explicitly for r in terms of Y,

$$r = \frac{C_o - cT^* + I_o + G^*}{v} - \frac{1 - c(1 - x)}{v} Y.$$
 (3.12)

Next, substituting (3.7) and (3.8) into (3.9), we obtain

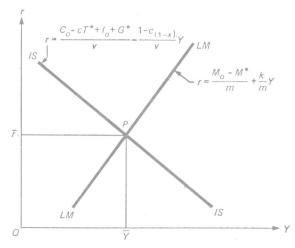
$$M^* = M_o + kY - mr, (3.13)$$

or, solving explicitly for r in terms of Y,

$$r = \frac{M_o - M^*}{m} + \frac{k}{m} Y. {(3.14)}$$

Equation (3.12) is the IS curve discussed in the Holbrook article in this chapter (reading 1). It is derived from equations (3.1) to (3.6) in the above model

Chart 1: Determination of Income and Interest Rate by IS and LM Curves



and represents the various combinations of income and the interest rate that will equilibrate the market for goods and services—that is, will result in aggregate demand (C + I + G) being equal to total output (Y). The slope of the line $(\Delta r/\Delta Y)$ is -[1-c(1-x)]/v. Since c and x are both less than unity, 1-c(1-x) is necessarily positive, as is v. Consequently, the slope of the IS curve is negative—that is, it slopes downward to the right. The commonsense economic explanation is that a reduced rate of interest will lead to more investment, which, through the multiplier, will raise income; thus, a fall in the rate of interest will be associated with a higher level of income. The IS curve is shown as a downward-sloping line in Chart 1.

Equation (3.14) is the LM curve, also discussed in the Holbrook article. It is derived from equations (3.7) and (3.9) and represents the various combinations of Y and r that will result in equilibrium in the money market—i.e., equality of demand for and supply of money—with the given stock of money, M^* . The slope of the LM curve $(\Delta r/\Delta Y)$ is k/m. Since k and m are both

positive numbers, the slope must be positive. It is useful to think of money holdings as consisting of two parts: transactions balances required for the conduct of current economic activity by households and firms and asset balances held as a part of wealth portfolios. The demand for transactions balances may then be regarded as related positively to income, and the demand for asset balances as being related negatively to the interest rate. (The demand for money is discussed at some length in Ronald L. Teigen's paper in this chapter.²) Then, moving along the LM curve, a rise in income will increase the transactions demand for money, thereby leaving a smaller portion of the fixed supply (M°) of money available to satisfy the asset demand and causing the interest rate to rise as asset holders attempt to restore portfolio equilibrium by selling bonds. The LM curve is shown as an upward-sloping curve in Chart 1.

Equilibrium for the entire economy—including both the market for goods and services and the money market—occurs at the point of intersection of the IS and LM curves. This is point P in Chart 1, and the equilibrium values of GNP and the interest rate are \overline{Y} and \overline{r} .

The equilibrium level of GNP can be derived explicitly by eliminating r between equations (3.12) and (3.14). When this is done, we have

$$\frac{C_o - cT^* + I_o + G^*}{v} - \frac{1 - c(1 - x)}{v} Y = \frac{M_o - M^*}{m} + \frac{k}{m} Y,$$

or, solving explicitly for Y,

$$Y = \frac{1}{1 - c(1 - x) + \frac{vk}{m}} \left[C_o - cT^* + I_o + G^* - \frac{v}{m} (M_o - M^*) \right]. \quad (3.15)$$

This model contains three policy instruments which the authorities can adjust in order to control aggregate demand: the fiscal authorities can change government expenditures (G°) or the tax level (T°), while the monetary authorities can adjust the stock of money (M°). Multipliers which show the leverage of each of these instruments in changing GNP can be calculated quite easily. For example, the multiplier for government expenditures ($\Delta Y/\Delta G^{\circ}$) can be derived as follows: suppose the level of government purchases of goods and services is increased from G° to $G^{\circ} + \Delta G^{\circ}$. The new level of GNP is given by

$$Y + \Delta Y = \frac{1}{1 - c(1 - x) + \frac{vk}{m}} \left[C_o - cT^* + I_o + G^* + \Delta G^* - \frac{v}{m} (M_o - M^*) \right]$$
(3.16)

Subtracting (3.15) from (3.16) and dividing through by ΔG^* , we have

$$\frac{\Delta Y}{\Delta G^*} = \frac{1}{1 - c(1 - x) + \frac{vk}{m}}$$
(3.17)

² It should be noted that, as explained in Teigen's paper, some economists believe that the demand for money is almost entirely a transactions demand but that the transactions demand is dependent on both income and the interest rate. This leads to essentially the same conclusions about the functioning of money in the economy that are reached if the demand consists of a transactions component dependent on income and an asset component dependent on the interest rate.

³ For an extension of this analysis to the determination of equilibrium income, interest rate, and other variables for an economy with a foreign sector and balance of payments, see the introduction to Chapter 6.