Volume Title: A Theoretical Framework for Monetary Analysis

Volume Author/Editor: Milton Friedman

Volume Publisher: NBER

Volume ISBN: 0-87014-233-X

Volume URL: http://www.nber.org/books/frie71-1

Publication Date: 1971

Chapter Title: A Simple Common Model

Chapter Author: Milton Friedman

Chapter URL: http://www.nber.org/chapters/c0916

Chapter pages in book: (p. 29 - 31)

rate be flexible. This chink in the key assumption that prices are an institutional datum was minimized by interpreting the "interest rate" narrowly, and market institutions made it easy to do so. After all, it is most unusual to quote houses, automobiles, let alone furniture, household appliances, clothes and so on, in terms of the "interest rate" implicit in their sales and rental prices. Hence the prices of these items continued to be regarded as an institutional datum, which forced the transmission process to go through an extremely narrow channel. On our side, there was no such inhibition. Since we regarded prices as flexible, though not "perfectly" flexible, it was natural for us to interpret the transmission mechanism in terms of relative price adjustments over a broad area rather than in terms of narrowly defined interest rates.

6. A Simple Common Model

We can summarize the key points of the preceding sections of this paper, and lay a groundwork for the final sections, by setting forth a highly simplified aggregate model of an economy that encompasses both a simplified quantity theory and a simplified income-expenditure theory as special cases. In interpreting this model, it should be kept in mind that the same symbols can have very different empirical counterparts, so that the algebraic statement can conceal a difference as fundamental as that described in the preceding four paragraphs.

For the purpose of this summary, we can neglect foreign trade, by assuming a closed economy, and the fiscal role of government, by assuming that there are neither government expenditures nor government receipts. We can also neglect stochastic disturbances. What I shall concentrate on are the division of national income between induced and autonomous expenditures and the adjustment between the demand for and supply of money.

The simple model is given by six equations:

$$\frac{C}{P} = f\left(\frac{Y}{P}, r\right); \tag{9}$$

$$\frac{I}{P} = g(r); \tag{10}$$

$$\frac{Y}{P} = \frac{C}{P} + \frac{I}{P} \text{ (or, alternatively, } \frac{S}{P} = \frac{Y - C}{P} = \frac{I}{P}\text{)}; \tag{11}$$

$$M^D = P \cdot l\left(\frac{Y}{P}, r\right); \tag{12}$$

$$M^S = h(r); \tag{13}$$

$$M^D = M^S. \tag{14}$$

The first three equations describe the adjustment of the flows of savings and investment; the last three, of the stock of money demanded and supplied. Equation (9) is a consumption function (Keynes's "marginal propensity to consume") expressing real consumption (C/P) as a function of real income $(Y/P = y)$ and the interest rate (r). For simplicity, wealth is omitted, although, if the model were to be used to illustrate Keynes's proposition (1), and why it is fallacious, wealth would have to be included as an argument in the function.

Equation (10) is an investment function (Keynes's marginal efficiency of investment) which expresses real investment (I/P) as a function of the interest rate. Here again, consistent with both Keynes and subsequent literature, both the total stock of capital and real income could be included as arguments. However, in Keynes's spirit, the model refers to a short period in which the capital stock can be regarded as fixed. For a longer-period model, the capital stock would have to be included and treated as an endogenous variable, presumably defined by an integral of past investment. The inclusion of income in the equation, as an independent variable, would confuse the key point of the distinction between C and I. As a theoretical matter, the relevant distinction is not between consumption and investment but between expenditures that are closely linked to current income ("conditional" on income would, from this point of view, be a better mnemonic for C than consumption, though the term usually used is "induced") and expenditures that are autonomous, that is, independent (a better mnemonic for I than investment), of income. The identification of these categories with consumption and investment is an empirical hypothesis. For theoretical purposes, any part of investment spending that is conditional on current income should be included with C.

Equation (11) is typically referred to as the income identity. As the parenthetical transformation makes clear, it can also be regarded as a market-clearing or adjustment equation specifying that saving is to be equal to investment.

Equation (12) is the demand function for nominal money balances (Keynes's liquidity preference function). It is simply equation (6) or (7) rewritten in simplified form and expresses the real quantity of money demanded (M^D/P) as a function of real income and the interest rate. Here again, as in equation (9), wealth could properly be included but is omitted for simplicity.

Equation (13) is the supply function of nominal money. To be consistent with the literature, the interest rate enters as a variable. However, no purpose for which we shall use the model would be affected in any way by treating M^S as simply an exogenous variable, determined, say, by the monetary authorities.[17]

Equation (14) is the counterpart of equation (11), a market-clearing or adjustment equation specifying that money demanded shall equal money supplied.

These six equations would be accepted alike by adherents of the quantity theory and of the income-expenditure theory. On this level of abstraction, there is no difference between them. However, while there are six equations, there are seven unknowns: C, I, Y, r, P, M^D, M^S. There is a missing equation. Some one of these variables must be determined by relationships outside this system.[18]

7. The Missing Equation: Three Approaches

The difference between the quantity theory and the income-expenditure theory is the condition that is added to make the equations determinate.

The simple income-expenditure theory adds the missing equation in one form. Different versions of the quantity theory add it in two other forms. Of these, the missing equation that has been generally regarded in the literature as defining the simple quantity theory is discussed in this section. The missing equation supplied by an alternative version of the quantity theory that is implicit in much recent literature but has not heretofore been made explicit is discussed in the following section. I shall designate the alternative version of the quantity theory as the monetary theory of nominal income.

The simple quantity theory adds the equation

$$\frac{Y}{P} = y = y_0; \tag{15}$$

that is, real income is determined outside the system. In effect, it appends to this system the Walrasian equations of general equilibrium, regards

[17] This would be consistent with Cagan's findings about the absence of any significant effect of changes in the interest rate on the supply of money. However, to be consistent with his findings, income or some other indicator of business cycles would have to be included as a variable, as has been done in some empirical studies of the supply of money. See Cagan (1965, pp. 150, 228–32) and Hendershott (1968).

[18] Of course, this is speaking figuratively. It is not necessary that a single variable be so determined. What is required is an independent relation connecting some subset of the seven endogenous variables with exogenous variables, and that subset could in principle consist of all seven variables.