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FRIEDMAN'S THEORETICAL FRAMEWORK

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by

James Tobin

Milton Friedman has earned our gratitude by the two articles[1] setting
forth his theoretical framework. He has certainly facilitated communication
by his willingness to express his argument in a language widely used in
macro-economics, the Hicksian IS-LM apparatus. He undoubtedly hoped that
use of a common theoretical apparatus would reduce the controversy about
the roles of monetary and fiscal policies to an econometric debate about
empirical magnitudes. If the monetarists and the neo-Keynesians[2] could
agree as to which values of which parameters in which behavior relations
imply which policy conclusions, then they could concentrate on the evidence
regarding the values of those parameters. I wish that these articles had

[1]"A Theoretical Framework for Monetary Analysis," Journal of Political Economy,
March/April 1970, and "A Monetary Theory of Nominal Income," ibid., March/
April 1971.

[2]I don't know what to call those of us who take an eclectic nonmonetarist
view. "Neo-Keynesian" will do, I guess, but so would "neo-classical." The
synthesis of the last twenty-five years certainly contains many elements
not in The General Theory; perhaps it should be called Hicksian, since it
derives not only from his IS-LM article but more importantly from his classic
paper "A Suggestion for Simplifying the Theory of Money," AEA-Readings in
Monetary Theory, pp. 13-32. One thing the nonmonetarists should not be called
is "fiscalists." The debate is not symmetrical. Whereas neo-Keynesians be-
lieve that both monetary and fiscal policies affect nominal income, monetarists
believe that only monetary policies do so. At least, I think that's the dis-
tinctive and characteristic message that monetarists have been conveying to
the profession and the public. Friedman agrees that this gives "the right
flavor of our conclusions."

brought us closer to this goal, but I am afraid they have not. I have been very surprised to learn what Professor Friedman regards as his crucial theoretical differences from the neo-Keynesians.

Money, Income, and Prices in Short-Run Equilibrium

First, let me explain what I thought the main issue was. In terms of the Hicksian language of Friedman's two articles, I thought (and I still think) it was the shape of the LM locus. This locus is for given stock of money M and price level p the combinations of real income Y and interest rate r that satisfy $M/p = L(Y,r)$. It will be vertical if the demand for money is wholly insensitive to interest rates. This assumption leads to the following characteristic monetarist propositions:

(a) Y can be changed only if M/p is changed. The link between them may or may not be one of proportionality, and it may of course involve lags and leads and stochastic terms.

(b) In particular, a shift of the IS locus with M/p given, whether due to fiscal policy or to exogenous change in consumption and investment behavior, cannot alter Y .

(c) If Y is supply-determined, then M/p is determined and both the price level p and money income pY are proportionate to M .

The neo-Keynesian view is that the LM locus is upward sloping, because $\partial L/\partial Y$ is positive and $\partial L/\partial r$ is not zero but negative. Assuming that there is also some interest-sensitivity of investment and/or consumption, we have the following characteristic neo-Keynesian propositions:

(d) If Y is not uniquely determined by the supply equations of the system, it can be changed either by shifts in the IS curve, whether they stem from policy or other exogenous shocks, or by shifts in the LM locus, whether due to monetary policy or exogenous shocks.

(e) In particular an increase in the nominal stock of money M will be absorbed partly in an increase in Y , partly in an increase in p , and partly in a reduction in velocity due to a decline in the interest rate r .

(f) Even with Y supply-determined, price level and money income are not uniquely related to the nominal money supply M . They also depend on the interest rate and thus on fiscal policy. For example, an expansionary fiscal policy or any other upward shift in the IS locus will raise r , lower the stock of real balances demanded, and raise the price level corresponding to any nominal money stock.[3]

All this is the stuff of macro-economics courses all over the country. Professor Friedman, however, explicitly disavows belief that the demand for money is independent of interest rates and denies that his propositions depend on any such assumption. May we, therefore, assume that he accepts propositions (d), (e), and (f) and rejects (a), (b), and (c)?

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[3]None of these propositions depends on absolute liquidity preference (the trap) or, Friedman to the contrary, on any "tendency to regard k or velocity as passively adjusting to changes in the quantity of money." (Friedman 1970, p. 215).

Friedman shifts attention to the supply side of the model, the short-run relation of Y and p. I was certainly amazed to find this relationship—which he calls the "missing equation"—identified as the crux of the controversy. I had thought that both monetarists and neo-Keynesians agreed that short-run variations of money income (pY or MV), however caused, were generally divided between changes in output and changes in price. The common view, I thought, was that the proportions in which an increment in aggregate nominal demand go into output increase and price increase depend on the degree of pressure on existing labor and capital resources. There is plenty of qualitative empirical evidence for such a proposition, though plenty of theoretical and statistical doubt about its precise specification.

Anyway it is a caricature of the monetarist position to identify it with the notion that Y is wholly supply-determined in the short run. We know that Friedman himself has not assumed that. He summarizes his own view as follows: "I regard the description of our position as 'money is all that matters for changes in <u>nominal</u> income and for <u>short-run</u> changes in real income' as an exaggeration but one that gives the right flavor of our conclusions."[4]

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[4]Friedman goes on to say that "'money is all that matters, period' is a basic misrepresentation of our conclusions." When I tried to clarify the debate by distinguishing among the three propositions "Money does not matter. It does too matter. Money is all that matters," the context was perfectly clear. It was what matters in the determination of <u>money income</u>. In the same paragraph, "money is all that matters" is translated into "the stock of money [is] the necessary and sufficient determinant of money income." (Tobin, "The Monetary Interpretation of History" [A Review Article], discussion of <u>A Monetary History of the United States 1867-1960</u>, by M. Friedman and A. Schwartz, American Bankers' Association Conference, Princeton, also

It is equally a caricature of the neo-Keynesian view to say that p is an "institutional datum" in the short run. Keynes certainly did not make this assumption, nor did Hansen--and neither has any careful version of a complete neo-Keynesian macro-economic model.[5] Nor is it at all necessary for proposition (d). So long as Y is not wholly supply-determined, so long as prices are not completely flexible in the short run, the monetary authorities can change the <u>real</u> supply of money, not just the nominal stock. So long as Y is not wholly supply-determined, any analysis of the consequences of changes in the real supplies of monetary assets is relevant and

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[4](continued) in: <u>American Economic Review</u>, Vol. LV, No. 3, June 1965, p. 481.) There has been no basic misrepresentation. No one has accused Friedman and his colleagues of claiming that money is all that matters for the determination of <u>real</u> income in the long or short run, to the neglect of supply factors,--or all that matters for the cold war, or for the rotation of the planets. They have been represented as claiming exactly what he now agrees "gives the right flavor of our conclusions."

[5]Between the first and second articles Friedman learned that Keynes could at worst be charged with assuming a constant value of the money wage rate. (1971, p. 3, fn. 1). Since Keynes also assumed increasing marginal labor and user cost, a constant money wage implies a price level that rises with nominal income. But Keynes did not even assume a constant money wage. See, for example, his discussion (<u>General Theory</u>, p. 285) of "the elasticity of money-wages in response to changes in effective demand in terms of money." See also Hansen, <u>Monetary Theory and Fiscal Policy</u>, p. 136, where Figure 18 shows both prices and wages as increasing (and concave upward) functions of nominal effective demand. Keynesian theory does not require money wage rate rigidity, only stickiness in the sense that in the short run labor supply varies directly with the money wage for any given real wage.

legitimate.[6] Once again, just as in the debate over the shape of the money

demand function, Friedman has tried to saddle his opponents and critics with

an extreme assumption and to claim the entire middle ground for himself.

In both cases the truth is that it is his propositions, not theirs, which

depend on a special polar case.

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[6] In the first article Friedman (1970, p. 211) attacks papers by me and my
colleague William Brainard on the ground that "the entire analysis is valid
only on the implicit assumption that nominal prices of goods and services
are completely rigid." This is not true, as Friedman's own footnote of
explanation makes clear. An example of our crime, it turns out, is to "assume
that central banks can determine the ratio of currency (or high-powered
money) to total wealth including real assets.... If prices are flexible,
the central bank can determine only nominal magnitudes, not such a real
ratio." To believe that the central bank can affect real magnitudes as
well as nominal quantities, it is not necessary to assume that prices are
rigid. It is necessary only to assume that prices are not perfectly flexible,
that output is not perfectly rigid. Some further observations on Friedman's
attack are in order:

> (a) The papers he is criticizing did not pretend to provide complete
> macro-economic models. Their objective was to refine and genera-
> lize the "LM" sector. Given this limited focus, we did not feel
> obligated to elaborate all other macro-relations, including those
> connecting p and Y . We did not think it would be controver-
> sial to attribute to the monetary authorities some real effects
> in the short run. After all, that is what Friedman believes too.

> (b) Even if Y were supply-determined and prices were completely
> flexible, the structure of the demand sectors of the macro-economy
> (IS and LM) is still of interest. Our system of "LM" equations
> could be solved for the commodity price level and the structure
> of interest rates, given the level of real income, the real rate
> of return on capital, and the nominal values of exogenous monetary
> quantities.

> (c) In some of our models there is more than one exogenous asset de-
> nominated in the monetary unit of account. In addition to having
> a monetary debt, the government has obligations not payable on
> demand. Unless the government is constrained always to change
> the nominal quantities of its n types of monetary obligations
> in the same proportion, it must be capable of altering the real
> quantities of at least n-1 of them.

Friedman's second article is, if possible, more surprising than the
first. The "missing equation"--apportioning changes in money income between
price and output--is no longer the crux of the matter. Instead, we are asked
to assume that in the short run both the real interest rate and the nominal
interest rate are fixed. The real rate, which is relevant to real invest-
ment and saving decisions, is identified with the net marginal productivity
of capital along the normal growth path.[7] This yield changes very slowly,
if at all. The nominal rate is simply the real rate plus the anticipated
rate of inflation, which is taken to be firmly predetermined by past experi-
ence and other considerations.

Friedman invokes the memory of Keynes, as well as that of Fisher,
as inspiration for this construction. The Keynesian touch is that specu-
lators keep the actual nominal rate at its proper value. But it is impor-
tant to note that these are not Keynesian "liquidity preference" speculators
between money and bonds. They are Fisherian speculators between goods, or

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[7]The real interest rate is constant, ρ^* , in a neo-classical golden age.
So also, of course, is its difference from the long-run rate of growth,
g^* , as indicated in equation (12) of Friedman, 1971. But Friedman's equa-
tion (13) $\rho^* = g^*/s^*$ is puzzling to those of us who would have expected
$\rho^* = \frac{\alpha^* g^*}{s^*}$. Here s^* and α^* are the equilibrium proportions of saving
and of capital income respectively in Net National Product. Friedman is
assuming that $\alpha^* = 1$, that all productive resources are reproducible
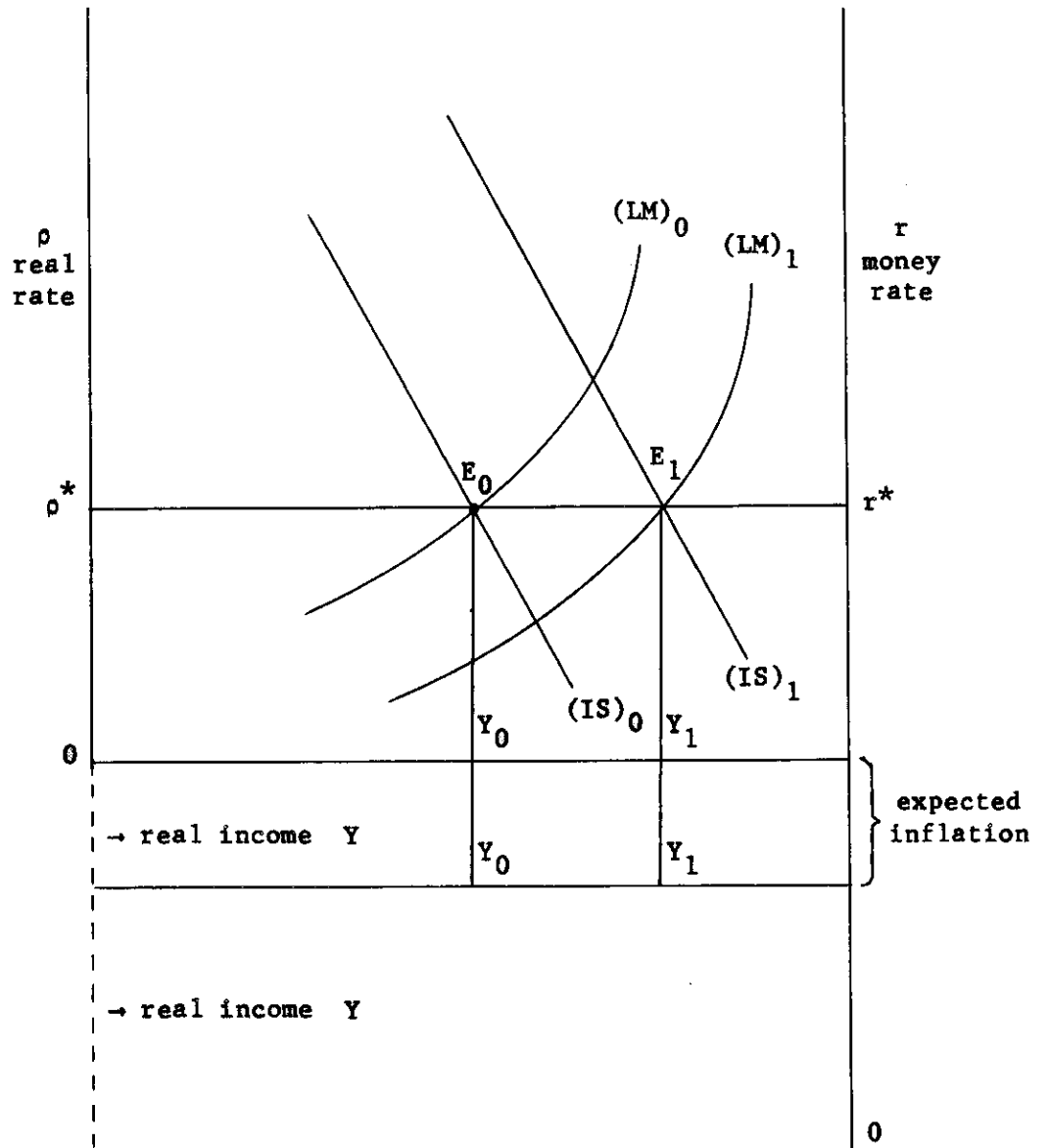capital endogenously supplied.

FIGURE 1

equities in goods, and bonds. The nominal interest rate is not in a liquidity trap. There is indeed, for every M/p , a normally shaped LM curve in the nominal interest rate and real income. But the only point on it that matters is the one that corresponds to the exogenously determined interest rate.

The level of real income is determined wholly by the IS (or multi-plier) equations, once the real rate of interest is given. Given $\frac{M}{p} = L(r,Y)$, the fixing of both r and Y determines M/p and leads to a short run quantity theory of both price level and money income.

The system is illustrated in Figure 1. Given the $(IS)_0$ locus and the real rate ρ^* , the equilibrium E_0 is determined with real income Y_0 . The nominal rate is measured on the right-hand vertical axis, displaced from the left hand, real rate, axis by the expected rate of inflation. There is a family of LM curves, connecting real income and the nominal rate, of which two are shown: $(LM)_1$ corresponds to a greater real stock of money M/p than $(LM)_0$. The only LM locus that can coexist with $(IS)_0$ is $(LM)_0$. If the authorities try to shift $(LM)_0$ to the right by increasing M , their efforts will be frustrated by an offsetting rise in p .

Fiscal policy, however, can control real income. Indeed an increase in real government purchases will have the full multiplier effect--for example, shifting the IS locus to $(IS)_1$ and real income to Y_1 . The LM curve will follow along, shifting to $(LM)_1$; this will require a re-duction of p if the nominal stock of money is kept constant or increased

insufficiently.[8] So deficit spending increases output and employment, and lowers prices and money wages. Prices are completely flexible, not because output is supply-determined but because it is multiplier-determined.

As this result suggests, the model is bizarre, and it is hard to imagine that it is seriously intended. Critics have complained that the constant-velocity assumption of monetarism ignores interest rate effects on the demand for money. It is indeed difficult to persist in maintaining that they are negligible while simultaneously stressing the importance of the rate of price inflation both for nominal interest rates and for velocity. So here is a model that acknowledges the interest sensitivity of the demand for money but preserves the quantity theory by the simple expedient of fixing interest rates. But the cost of this expedient is to concede fiscal policy more control over output and employment than virtually any Keynesian would claim.

The author himself offers this model as tentative and expresses serious doubts. He doubts that the real rate should really be regarded as a constant in the short run, and he is surely justified. The rate of investment depends, on the one hand, on estimates of the future stream of quasi-rents

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[8] In this Friedman model the demand for money equation is

$$\frac{M}{p} = y\ell(r) \, ,$$

which makes income-velocity constant at a given interest rate. He could just as well use the more general formulation $M/p = \ell(y, r)$.

The model is reminiscent of Mundell's IS-LM analysis of fiscal and monetary policy in a small open economy with complete international mobility of capital and fixed exchange rate. There too the interest rate is externally given and the LM curve floats to whatever equilibrium the IS equations determine.

from the ownership of capital and, on the other, on the discount rate at
which this stream is converted to present value for comparison with the
cost of capital goods. Both of these determinants are subject to short-
run changes connected with departures from the long-run growth path of the
economy. Securities markets provide a somewhat exaggerated index of these
fluctuations, in the ratio of the market value of claims on business income
to the reproduction cost of business assets. The sensitivity of this ratio
to short-run changes in business activity, and the sensitivity of invest-
ment to this ratio, are important determinants of the short-run stability
or instability of the economy.

Friedman finds it easy to accept the assumption of his model that
the only short-run fluctuations of nominal interest rates relevant to the
demand for money are those associated with the inflation premium. This
is not consistent with his acknowledgment that real rates relevant for in-
vestment and saving decisions vary in the short runs. Nor is it consistent
with the ample empirical evidence of rapid interest rate gyrations. When
the Treasury bill rate falls 350 basis points and the corporate bond rate
150 basis points in seven months, as happened July 1970-February 1971, it
strains credulity to attribute the decline to a change in inflationary ex-
pectations, the more so when inflation continued unabated and when in any
case Professor Friedman has taught us that these expectations are a slowly
changing derivative of past experience.

The Dynamics of Price and Income

Friedman's ostentatious discovery of the problem of "the missing
equation" may give innocent readers the idea that macro-economics has ne-
glected or fudged an important relationship, without which its models are
logically and empirically incomplete. This is not true. Keynes certainly
included in his system a relationship between real output and the price
level, derived from a theory of labor demand and supply. All careful ex-
positions, mathematical or verbal, of the Keynesian model have done like-
wise. In postwar macro-economics the price variable has slipped one deri-
vative, and the "missing equation" is the complex of price-wage-employment-
output relations summarized partially in "Okun's law" and partially in
"Phillips curves" for wages and prices. A large fraction of the profession
is preoccupied with theoretical and empirical investigations of these matters.

Friedman's particular proposal is simply a Phillips trade-off which
vanishes in the long run. Characteristically, his long-run equilibrium
relations connect expected or normal values of output, nominal income, wage
and price--both levels and rates of change. These normal values are moving
averages of past actual values. Disequilibrium relations apply to surprises,
that is to deviations of the actual values of these variables from expected
values. In particular, surprises in growth rate of nominal income are divided,
for unexplained reasons, and in unexplained proportions, between deviations
in the growth rates of price and of real output. Moreover, deviations in
the level of real output contribute to positive deviations in the rate of
price inflation. Following is Friedman's equation for the rate of infla-
tion, as derived from equations (27)-(29) of the first article:

$$\frac{\dot{p}}{p} = \frac{\dot{p}^*}{p^*} + \frac{\alpha}{1-\alpha}\left(\frac{\dot{y}}{y} - \frac{\dot{y}^*}{y^*}\right) + \frac{\gamma}{1-\alpha}\,(\log y - \log y^*)$$

p is price level, y is real income, and the starred symbols represent expected values; α, $1-\alpha$, and γ are all positive. The parameter α measures the price proportion of a deviation in the growth rate of nominal income; $1-\alpha$ is the output share. The equation will be recognized as a standard price Phillips curve. The variable $\left(\dfrac{\dot{y}}{y} - \dfrac{\dot{y}^*}{y^*}\right)$ is related to the change in unemployment, and the variable $\log y/y^*$ to its level. That the long-run Phillips curve is vertical is insured by entering expected price change $\dfrac{\dot{p}^*}{p^*}$ with a coefficient of one; y^* corresponds to the natural rate of unemployment.

This is not the place to discuss the natural rate hypothesis. I will merely record my view that there is a great deal more to the short-run interrelations of wages, prices, employment, and output than can be captured by a model of universally agreed expectations and deviations from them. Aggregation is always risky, but it seems particularly inappropriate to pretend that aggregate variables obey the relationships that would be expected in a single homogeneous product and labor market.

In the architecture of Friedman's theoretical framework, nominal income is the keystone. The "missing equation" dynamics just reviewed are designed to explain the division of changes of nominal income between price and output. The other side of the arch is the dynamic dependence of nominal income on money supply. Apparently it is now doctrine that the link of these two variables is the same regardless of the split of changes in nominal income between price and output. It was not always so--in Friedman's earlier

permanent income model of the demand for money both price and income his-

tories were determinants of velocity. Evidently Friedman has also abandoned

his earlier idea that the long-run elasticity of demand for real money balances

with respect to real income is greater than one, and with it his earlier

confidence in a secular downtrend of velocity.

The dynamic link of nominal income to money is only suggestively

sketched in the two articles. The basic idea is that in moving equilibrium

the growth rate of the money supply and the expected growth rate of money

income are equal. As usual the expected growth rate of money income is a

slowly changing moving average of actual growth rates in the past, when

money supply grows faster than equilibrium rate, money income does likewise.

This is the dynamic proposition.

However, Friedman is interested in establishing a stronger proposi-

tion, namely that the income velocity of money rises when the growth rate

of the money stock exceeds the expected growth rate of money income. In

the past he offered his permanent income theory of money demand as an expla-

nation of this phenomenon.[9] He now offers an alternative or complementary

explanation (1971, pp. 331-32). This relates the pro-cyclical movement of

velocity to the pro-cyclical movement of interest rates--superficially at

least the orthodox Keynesian interpretation which Friedman has so stubbornly

resisted for so long. In Friedman's version, it is true, interest rates

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[9] See my article, "Money and Income: Post Hoc Ergo Propter Hoc?", Quarterly Journal of Economics, Vol. LXXXIV, May 1970, pp. 301-317, and the ensuing discussion, ibid., May 1970, pp. 328-29, for criticism of this explanation. Although it is consistent with observed pro-cyclical fluctuations of velocity, it is not consistent with Friedman's own evidence on the cyclical timing of money and income peaks and troughs.

rise during a money-generated boom in nominal income only because the boom in actual income raises expectations of income and price inflation.[10]   But the camel's nose is in the tent.

The Long-Run Quantity Theory

The first of the two articles under discussion begins with an exposition of the "quantity theory." The phrase has, it turns out, a number of different meanings:

1) Emphasis on the distinction between the real and the nominal quantity of money, and on the fact that what matters to rational individuals is the real quantity.

2) Use of the quantity identity, $MV = PQ$ or some variant, as an organizing framework for macro-economic analysis.

3) Belief that the central equation of macro-economics is that of the demand for money to a largely exogenous supply.

4) Interest in the determinants of the demand for money, and the size and direction of their effects.

5) Assertion that in the short run nominal income is proportional to the supply of money, although changes in nominal income may affect output as well as prices.

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[10] Incidentally, Friedman's Phillips curve does not justify his assumption that price and money income expectations always move together. Nor does his "monetary theory of nominal income" imply that all changes in money income, inflation expectations, and interest rates are induced by changes of money supply. Within his own framework, the determination of velocity is a good deal more complex than he suggests.

6) Assertion that real magnitudes are in long-run equilibrium independent of the nominal quantity of money, so that nominal magnitudes--prices, money incomes--are simply proportional to the nominal quantity of money.

Version (1) is not in dispute, and does not imply any other quantity theory proposition.

Versions (2) and (3) concern the language in which substantive arguments are expressed, not the substance of the arguments. Keynes could have cast his arguments in the language of the quantity equation, just as Friedman could convey his message in IS-LM diagrams. In monetarist language all influences on nominal income other than the stock of money are dumped into velocity (or its Cambridge reciprocal). This may be awkward but it is not impossible. Of course the roster of determinants of velocity may include more than one endogenous variable. If so, the demand-supply equation for money cannot constitute a complete model of nominal income in Chicago or anywhere else. This brings us to (4) and to the observation that nonmonetarists as well as monetarists fill the journals full of studies of the demand for money in its several definitions. The fifth assertion has been the subject of the first part of my comment.

The sixth proposition is the neutrality of money in long-run equilibrium: absolute prices and other nominal quantities are proportional to the stock of money; real magnitudes and ratios of prices (including interest rates) are independent of the stock of money.

It is important to stress that this quantity theorem--which should be called the quantity of money theory of prices rather than the quantity

theory of money--is not in general implied by rationality, absence of money
illusion. True, no self-respecting theorist believes that de Gaulle made
any real economic difference when he cut two zeros off the franc, thus re-
ducing the supply of money in the unit of account to one hundredth of its
former amount.

The fallacy of misplaced concreteness is the tacit identification
of every change in the supply of money, as engineered by government, cen-
tral bank, and private banks, with a monetary change of the nature, if not
the magnitude, of the change from old to new francs. There is a true quantity
theorem, to be sure, but it is a more general proposition than the quantity
of money theory of prices, and an emptier one.

The true quantity theorem is as follows: Consider a system of supply
and demand equations for goods and services, and for stocks of assets and
debts denominated in the monetary unit of account. Given tastes, technologies,
and certain exogenous variables, these supplies and demands will be functions
of nominal prices. Among the exogenous data will be some quantities defined
in the monetary unit of account, including the monetary base of currency
and bank reserves, and the outstanding stocks of government debts of other
kinds and maturities. Now suppose that with a given vector of these exogenous
monetary quantities, the system is solved for equilibrium commodity prices
p_e . If every exogenous monetary variable is then multiplied by the same
positive scalar λ , then the price vector λp_e will solve the system,
with every physical quantity unchanged and every endogenous variable measured
in the unit of account scaled up or down by λ . This theorem, if it should
be so dignified, is a simple consequence of the "homogeneity postulate" or

the absence of money illusion. A corollary is that the prices of various monetary assets in terms of the unit of account will be unchanged; interest rates do not depend on the quantities of these assets when they all change in the same proportion.

It should take only a moment's reflection to convince anyone that the usual operations that alter the quantity of money, in any of its usual definitions, fail to meet the conditions of the theorem. First, open market operations typically consist in changing some exogenous monetary variables in the opposite direction from others, not in moving them all in the same direction and same proportion. Second, except in the longest of runs the list of exogenous monetary variables is very long, including individual as well as aggregate stocks and unmatured private debts contracted in the past. While a Gaullist monetary reform scales all these up or down in proportion, ordinary monetary operations do not.

The strict quantity theory applies only if there is a single exogenous monetary variable which is "money" except for a factor of proportionality, e.g. reserve requirements. Much monetary theory, modern as well as ancient, has developed from a model in which government debt and the monetary base are one and the same. But in a model with various kinds of government liabilities, time as well as demand obligations, it is easy to show that the real equilibrium--e.g. capital intensity and marginal productivity of capital --depends on the proportions in which these liabilities are supplied. Even in the long run, the real quantity of money depends on monetary policy, and accordingly monetary policy has other real consequences.

The crucial issue is whether government interest-bearing time debt
is of any significance. If not, then an increase in the quantity of money
has the same effect whether it is issued to purchase goods or to purchase
bonds. If all kinds of debt matter, then the genesis of new money makes
a difference. To borrow an overworked metaphor, is a "rain" of Treasury
bills--promises to pay currency in three months or less--of no consequence
for the price level, while a "rain" of currency inflates prices proportionately?

It may be true that the debt involves an expected stream of taxes
equivalent to the stream of interest. But the two streams do not wash out.
Bills and bonds share some of the attributes, and perform some of the func-
tions, of the currency they promise to pay. The government has a monopoly
of their issue, as it does of currency. So long as the government does not
expand the supply of these assets to the point where the public no longer
pays an interest premium for their advantages, they will be valued more
highly than the corresponding stream of taxes. The tax liabilities forced
into public balance sheets are not the same in maturity, risk, convenience,
etc. as the government obligations of which they are the counterpart. The
tax liabilities will be discounted at the rate appropriate for the incomes
on which the taxes are levied.

Interest-bearing debt will also, in general, have important distri-
butional effects. Some of the taxes to pay the interest may be levied on
wage income. If such levies were just proportional to property income,
one could argue that--risk and portfolio considerations aside--government
debt is neutral. It changes neither the demand of the population for a
given stream of after-tax income from nonhuman wealth nor the capacity of

any given capital stock to generate such a stream. But if wage incomes are taxed to pay bond interest, after-tax human wealth is reduced while nonhuman wealth is increased. Now human wealth and nonhuman wealth are not in general perfect substitutes for each other; indeed they are comple- ments--the larger are households' permanent labor incomes the greater will be their demand for nonhuman wealth. Government debt displaces some capital investment from the saving of the labor force; taxation of wages to pay bond interest also diminishes the total supply of saving. Monetization of the debt eliminates the second effect.

The two articles do not provide monetarism, either its short-run or its long-run propositions, with strong theoretical support.