10. The parameter estimates for the constrained subperiod are presented for completeness, but do not represent "effective" demands and supplies. Changes in B -- DS are not controlled for, so the parameters confound effective demand coefficients and correlations of existing right-hand variables with net exogenous capital flows.

11. Adding - 1 to the estimated import elasticities yields the traditional Marshall-Lerner elasticity in "volume" terms.

12. In Conway (1987), the changing force of tariff and non-tariff barriers in aggregate supply and imported-input demand equations was captured for the 1963-1980 period by allowing the coefficient on the tariff variable to differ from that of the foreign price. This bias the consideration of a more homogeneous period made parameter instability less likely in those results.

**BIBLIOGRAPHY**


Eastern Economic Journal, Volume XIV, No. 4, October-December 1988

**Alternative Views of the Monetary Sector in the Macroeconomics Course**

Stanley Boehr

Generally speaking one begins with accepting the conventional notion that the interest rate is endogenously determined by the interplay of demand and supply in competitive financial markets; and that it is entirely a monetary phenomenon and seen as a reward for parting with liquidity rather than, say, as a payment for abstaining from consumption. And assumed in all this, though not necessarily stated at the outset, is that the supply of money is endogenously determined; that is, that the central bank adjusts the overall volume of money in line with its policy objectives. Indeed that the money stock is a necessary variable in the conventional macro-Keynesian models to explain nominal income and the general price level. Now these assumptions (perhaps better seen as postulates) have been thrown open to much doubt and a good case has been made for the approach that reference need be made to the money stock or, indeed, to any other monetary aggregate in explaining the level of real economic activity. It is likely that we are dealing with theoretical fiction when we talk in terms of a separate demand curve for money, or of a market clearing equilibrium rate of interest in relation to the IS-LM models.

1 Let us briefly consider the essence of the monetary schools of thought that until quite recently have held sway. The Monetarist school espouses close and direct links between changes in the money supply and changes in money incomes. There is causal arrow running from the money supply to either nominal income or the general price level; that is:

\[
\Delta Y = \Delta M
\]

where the \( Y \) is the marginal income velocity of money. Although there did arise at times some hint of a feedback mechanism showing the reverse tack, this was submerged under the supposed governing power of money based on the accepted strong relation of \( \Delta M \rightarrow \Delta P \). Though under conditions of less than full-employment, say during cyclical recessions, one also puts forth the link from \( \Delta M \rightarrow \Delta Q \), though there is uncertainty as to the money income split between \( Q \Delta P \) and \( P \Delta Q \) subsequent to \( \Delta M \). But this is glossed over due to the primary emphasis given to the relation between money and prices which is based on the Quantity theory's assumption that the economy tends towards long-run full-employment of output. This attitude rests on the existence of an "orderly labor market" which clears at full-employment and results in an aggregate supply curve as seen in Figure (1). The underlying feature is that the supply curve of labor depends on the real wage, and the labor market adjusts to maintain the real wage and hence the level of employment. Then with given technology the level of output is determined; thus there is no change in equilibrium real output as prices rise, as it is a function of real conditions.

Money matters because inflation is inherently a monetary phenomenon. We do recall Professor Friedman's "money out of the blue" example where money is dropped from a
equilibrium and there is an increase in the supply of loanable funds (by a cash injection via the banking system) with the initial result that the rate of interest falls below the rate of return on capital. The result is an increase in the volume of borrowing as the price of investment goods interests and the demand for loans is stimulated. Now as the demand for loans overtakes the supply of loanable funds the rate of interest will begin to rise. If the rate of return on capital remains unchanged equilibrium will be restored when the rate of interest has returned to its original level. Of course the rate of return is not affected, for if the injection is a doubling of money supply which leads to a doubling of prices, then what we have is a doubling of costs and a doubling of money returns. When the additional cash has been absorbed into circulation by the price increase, people increase their demand for loans to the same extent that bases originally increased their supply, and the equilibrium rate is ultimately unchanged. If the equilibrium rate is to change permanently, it will come via a change in the rate of return in the commodity market that say reflects a change in technology which affects the investment demand curve. The monetarists did not leave unconnected the money market from the “real” market; what we have is a real theory of the rate of interest.

The onset of Keynesian economics and the subsequent IS-LM analysis considered by some as “Neoclassical Keynesianism” brought forth different attitudes that now come to form the core of Macroeconomic courses. Keynes insisted, of course, that the rate of interest was a monetary phenomenon and as such can be determined by the interplay of demand and supply on the money market. For Keynes, the interest rate was a reward for parting with liquidity rather than abstaining from consumption. The interest rate is not viewed as a mechanism for generating savings; indeed for Keynes savings is a function of income, whereas for Monetarists savings emerges as a function of the interest rate and the level of prices via the state of investment opportunities. It bears to repeat the point that Monetarists do not see the rate of interest as being determined by the quantity of money in circulation.

The stability of income velocity is an important aspect of “Monetarist Economics”; that is, what is stable is the demand for money, and it is this stability which gives the link between the money supply and the flow of nominal income. Now should this flow correspond to one of full utilization and full employment, then we get the firm link between the money stock and the price level. For Neoclassical Keynesians velocity is uniquely dependent on the rate of interest, and given the latter variability the link between money supply and nominal income is weak and unpredictable. There are differences in the basic design between the two schools, and this is not the place to expound fully on them. But we do mention one further important difference concerning the transmission mechanism from money to the real sector. Keynesians see a rather indirect transmission in which changes in the money supply trigger changes in the interest rate which lead to changes in investment which, via the multiplier then changes the real sector of the economy. Monetarists, believing that change in the money supply is the most important factor, post a strong and direct link running from the money supply to the level of economic activity via the real balance effect. A further point of difference is that Monetarists would adopt a policy of steady and known rate of advance in the money stock along the lines of the Friedman rules, based on the belief that discretionary attempts by central banks to adjust the money supply generally end up enhancing rather than dampening cyclical variations. Modern Keynesians maintain faith in discretionary policy to fine-tune the system—a belief that was widely held until recently when this approach proved unworkable.

Well, enough about background, as we now want to see the Post-Keynesian Monetary Paradigm which sets itself apart from both schools of thought.
II

Whatever the differences between Keynesians and Monetarists, what is basic to both schools is the notion that the money supply determination is outside the system; that it is endogenously determined by the central bank. Changes in the money supply may very well occur in response to economic conditions, but they are considered not to be "functionally related" to those conditions in any automatic sequence. Neo-Ricardians expose a different view by adopting an "endogeneous money supply" approach in which changes in the money supply are not causal, but are the consequence of conditions that alter the demand for money. This new paradigm puts forth a revision of Say's law to the effect that changes in the demand for money creates, at least in a first approximation, equivalent changes in money supply.

Now in putting forth this approach, Post-Keynesian Monetarists reject some essential ingredients of existing monetary theories; the idea that the economy tends towards the long-run full employment equilibrium outcomes, the viewpoint that the velocity of circulation is stable and independent of the rate of interest, and a rejection, of what is most fundamental, that of the "casual arrow" running from the money supply to nominal income or to prices. The question now is what is the "mechanism" that automatically triggers the money supply change to accommodate demand, i.e. to give that endogeneous money supply model.

One mechanism stems from the Weintrob-Kalecki connection resulting in Professor Weintrob's well known wage-cost-markup equation (WCM). For each firm we can write:

\[ P = k \frac{w}{A} \]

Where we see the mark-up in the form of a coefficient \( k \) by which unit labor costs is multiplied to obtain the price. So that generalizing for the economy we have:

\[ P = k \frac{w}{A} \]

Where \( w \) - average money wage

\[ \frac{W}{N} \]

\( A \) = average labor productivity

\[ \frac{Q}{N} \]

\( k > 1 \) (being the average price mark-up or gross profit margin). This follows along Kaleckian lines in which prices are cost determined. Interestingly enough this variable has been shown to be remarkably stable in Gross Business Product data. Of all the ratios in the system (k) is the most stable, as it is shown to be around 1.9 for many years.

Equation (2) stemming from (1) gives the cost equation, and we can state the consumer demand equation as:

\[ D = D(P_1, P_2, ... P_n, Y) \]

where the \( P_i \) 's are the individual prices and \( Y \) is nominal income. Now in an aggregate sense we have:

\[ Y = PQ \]

and as \( A = Q/N \) which upon substitution in (2) gives:

\[ P = k \frac{wN}{Q} \]

leading to \( Y = k\frac{wN}{Q} \)

The demand equation may then be written as:

\[ D = D(P_1, P_2, ... P_n, k\frac{wN}{Q}) \]

The independence of the demand and cost equations is revealed in equation (7). For example, a change in the mark-up coefficient would increase unit costs and then the price level which would then impact on the demand equation. However, taking (k) and (N) as given, it is the average money wage which emerges as the determining force regarding prices; and note that nothing has been said about the money supply. Should (N) be the variable then prices would depend upon the productivity of labor as demand changes as well as on money wages. The changes in the money wage will change both the cost and consumer demand functions, and thus both the price level of a particular good as well as prices generally. An upward move in (w) can be said to simultaneously exert a "cost-push" and in the consumer markets a "demand-pull."

Now if we presume that the productivity of labor amount at a relatively constant rate over time, then prices become determined by the difference between (k) and (A); if \( w > A \) prices will rise. Price levels become resolved once the money wage is given, that is,

\[ P = P(w) \]

It is an essential tenet of Neo-Ricardian economics that prices are a function of nominal wages.

At this point a slight digression is in order. The microfoundations of the Neo-Ricardian (Post-Keynesian if you will) model is price based on Kalecki's vision. This basis, unlike the core of neoclassical theory, does not, in general, exclude by assumption the important institutional arrangements that have emerged over the last hundred years or so. We refer to the large corporation (or mega-corp) that has grown to dominate the world economy. It is the mega-corp that has been able to maintain the mark-up needed to assure the required rate of business savings and thereby to generate the funds needed to finance investments. The change in prices depends upon the requirements of these firms for internally generated investment funds and upon movements of production costs. And, as well, Post-Keynesian Theory does not exclude by assumption the industrial trade union which has emerged in the wake of mega-corp and serves as the balancing weight in the negotiations over relative income shares.

Getting back to the mainline of reasoning, we then consider the money wage as determined at the bargaining table (we do not think in terms of orderly labor markets) or by government decree. Now if such an outcome results in \( w > A \) it will cause prices to rise by a determined mark-up over unit labor costs (by virtue of mega-corp power). The immediate effect for a given output volume and employment is an increase in nominal income. The causal arrows run from wages to prices to nominal income, with the latter increasing in directly proportion to the increase in prices in the short run, i.e. given employment.
This higher level of nominal income will increase the demand for credit consisting of the demand primarily for business loans to sustain the higher level of economic activity. But if this increase in demand is not to curtail the current level of employment and output via the higher interest rates that can be expected to follow, then the money supply will have to accommodate the corresponding increase in demand. In saying this we presume that the velocity component is constant; for then the existing level of employment and output as maintained only via a full accommodation by the central bank. But of course the other side of this relation is that velocity shows up as a constant because there has been full accommodation; if the money supply increases in proportions to increased in nominal income, then the ratio of income to money is unchanged.

The basis for this endogenous money approach is that the central bank has the power to increase the money supply accordingly and that it will "automatically" want to do so because of its continuous support of a government policy goal of sustaining real levels of output.

Consider the following:  

A rise in money wages will almost always induce an increase in money supply unless, for some reason, the Central Bank hopes that a contraceptive policy will restrain money-wage rises. In recent years, such hope has proven illusory. Ordinarily, if wage increments exceed productivity, and if there is excessive unemployment, more money will have to be provided merely to maintain recent production levels. Public pressure to ameliorate unemployment is likely to prevent a seriously constraining policy; with the labor force growing, an expansion in money supply will, sooner or later, become unavoidable. To satisfy the public concern to curb unemployment, the immediate growth in money supply will have to exceed that allowed by any "normal" rule.

In turn, where social and political attitudes determine the wage money exogenously, low levels of unemployment are also likely to be a policy aim. So long as the price level, for the most part, is set by wage bargains which are beyond the control of the Central Bank, the Monetary Authority, at best, can ensure ample supplies of money to maintain current spending and thus full employment and growth. It is ill-equipped, however, to exert any effective control over price levels.

We now come to see that the price level is not directly linked to the money supply; it is directly linked to the wage bargain and labor productivity. The money supply is seen to be indirectly related to the price level via a supportive role by sustaining levels of employment and thus the agreed upon wage level.

Suppose that the monetary authorities do not at all or only partially accommodate the supply of money to the increased demand for money; then in true Keynesian fashion, interest rates will rise reducing demand and via the multiplier result in a decline in the volume of output and employment. This decline in nominal income predominately via real reduction (given the administrative nature of prices) results in "forcibly reducing" the demand for funds to equal the degree of central bank accommodation. Now this wash-out of the increased demand for funds could be severe and perhaps these have some direct impact on prices (in the case all the more of absolutely no increase in money supply) but more likely the relation to prices will come via the impact that the increase in unemployment will have in tempering wage demands.

We do want to stress that this attitude serves the normally assumed causal relationship between the money supply and the price level. Money matters in its influence on prices, but only in a sort of passive way via its impact on output through interest rate movements, and here there is much uncertainty as to the degree of response involved. With regard to any "direct effect," money matters only if it effects a portfolio shift out of securities that spills over to a change in effective demand.

This "Weinreich Model of Endogeneity" assumes that velocity of circulation is constant. Of course when there is full accommodation, it is a constant; but where there is not such an accommodation the velocity is not assumed to increase to fill the gap between money supply and money demand. We may want to look at some evidence here. A recent review of econometric studies fails to confirm the existence of a demand curve for money to the extent that the demand for money depends negatively on short-term interest rates. The concept of velocity is, as we know, closely tied to the demand for money; so that there does not seem to be corroboration for the belief that velocity rises along with "high" interest rates, i.e. along with a reduction in the demand for money balances. Now this leads us either to the belief that we have had a fully accommodating monetary policy so that interest rates (say the three month T-bill rate) have shown a generally stable trend, or if that is not the case (and it is not, with the T-bill rate showing a marked upward movement from the mid-40's to the mid-50's) and the usual movement in velocity not in evidence, then there is something else going on out there that is mitigating central bank policy and overall maintaining or increasing real output levels and employment.

What is happening is that the increase in velocity as normally reckoned is quickly exhausted if it ever shows up at all; indeed we cannot count upon the conventional velocity notion to accommodate the increase in the demand for money. The attitude that higher interest rates activate idle balances, i.e. the demand side impact, is of little matter. It has been suggested that what is happening is a shift of the velocity curve to the right reflecting the appearance of an increase in money availability of an unconventional type (that is not in terms of M1 or of higher-powered bank reserves) as the demand for credit intensifies. We refer here to the increase in lending ability resulting from institutional changes in the banking system. For example when brokerage houses enter into banking, or when savings institutions begin doing the kinds of business once reserved for commercial banks, or the appearance of new money market CDs. We are getting different active money balances from new sources in response to an increase in the demand for money which means that the whole control over the money supply as conventionally envisaged has been greatly eroded.

The demand for money does create its own supply, but we must think of the money supply in terms of the "Effective Money Supply." Now this supply consists of what we might refer to as the direct money supply as brought forth by the central bank, plus the increase in velocity which, of course, must be seen as a proxy for direct money supply changes. But this velocity component is not to be thought of as being coated out of the existing system by changing interest rates; it is to be seen as the financial sector's response to central bank policy that may be less than fully accommodating in the direct money supply sense. This becomes clear when we refocus our thoughts somewhat to understand that it is not a demand for money per se, but a demand for financial credit that we are talking about to which the financial markets will find ways to adjust.

This leads us to conclude that the conventional monetary approach to deal with inflationary pressures is seriously eroded; but this should not imply that money does not count. Money does count but not as decisively; certainly severe non-accommodation in the conventional sense could overcome any velocity changes. Professor Roussea makes the point, "Conventional monetary policy as practiced since 1955 has proved to be a failure on all counts—Keynesian as well as monetarist. An effective monetary policy must be able to deal with destabilizing developments in the financial sector of the economy. The traditional tasks of open market operations, the discount rate, and manipulation of reserve requirements are no longer adequate."
In general we can say that Post-Keynesians either see demand creating its own supply fully, or if the response of the money supply is not fully accommodating, then velocity will increase to fill the gap. Changes in the money supply and changes in velocity are considered substitutes for one another. The interest rate is exogenously set by the central bank which then determines credit demand and velocity accommodates the needed supply. The interest rate is not viewed as having any direct affect on the desire to hold money i.e. on any portfolio composition demand. And the stability of velocity is based on money supply, or better yet, credit supply accommodation and not on conventional Monetarist reasoning.

Neo-Ricardians take the position that it is the wrong approach to model the financial side of the system in terms of specifying separate demand and supply curves for money. As Professor Moore puts it: “Money does not enter the system like manna from heaven—or from the sky via Milton Friedman’s helicopter. Nor is it simply the creature of the central bank policies.” One should regard the money supply as essentially endogenous responding and accommodating to the level of money wages. And this view is in keeping with the historical fact, that the purpose of central banks has been to accommodate the stock of money to changes in the needs for trade.

Let us end by saying that when we take the interest rate as exogenously determined, and then view velocity in the Post-Keynesian frame, we do sever the Keynesian link between velocity and the rate of interest.

NOTES
2. Ibid., p. 177.
4. Ibid., p. 96.

A Product Line Life Cycle Model of Intra-industry Trade

William Milberg

Disatisfaction with traditional, static, factor endowment theories of international trade has recently surged (Gray, 1982, 1988, Krugman, 1983, Scott and Lodge, 1985). In the past fifteen years alternative theories have been developed that go further than the static Heckscher-Ohlin model in explaining recent trends. In this paper, two of these alternative theories of intra-industry trade and the technology gap theory, are combined in order to account for trade competitiveness based on technological progress. The argument shows that research and development expenditures (R&D) are a necessary ongoing form of investment and not a discretionary item as implicit in much of the literature on the theory of the firm. The result is that simply to maintain world market share and to remain profitable, an industry must, for some period of time, be at least as innovative as the same industry in a rival country.

In the model of intra-industry trade presented below, products are differentiated on the supply side. Innovativeness determines the firm’s ability to create a differentiated product, which in turn determines import penetration. By introducing the concept of the product line, we explicitly model the link between technological progress and world market share for each manufacturing sector. This model contrasts markedly with Chamberlinian models in which intra-industry trade follows trivially from common trade assumptions on the preference and cost structures.

We call the process depicted in the model the "product line" life cycle, since it is similar to the product life cycle but with the added component that the more innovative producer may develop a new, technologically sophisticated variety of existing products and drop from its product line the technologically less sophisticated goods in response to cost competition. The firm’s choice will influence its share of the world market and the level of export penetration. This view is perhaps more Schumpeterian than either either the product life cycle or Bhagwati’s (1982) "biological" model. In the product life cycle, technical progress is inevitable. In the "biological" model, it is performed with perfect foresight until the marginal revenue from innovation equals its marginal cost. In our model, relative technological progress is a requisite for survival in the market; the market creates the incentive for innovation for firms with the high-cost industry. The firm must be concerned not with the phase in the product life cycle of a single product, but with attaining or maintaining competitiveness in the technologically sophisticated goods in the product line. The traditional product life cycle view, associating a single product with a single industry, is obsolete, relevant only in the moments between phases of product innovation, when the product line consists exclusively of mature goods. In general, however, the product line consists of goods in all phases of the product life cycle. As a result, industry life expectancy

*University of Michigan, Dearborn, Dearborn, MI 48128. I would like to thank H. Peter Gray for his detailed suggestions on an earlier version of this paper. Alfred Eichner, Margaret Andrews, Robert Blocker and Esher Gossik also provided helpful comments.