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Summary and Implications

TWO TRADITIONS IN MONETARY THEORY

The double function of commercial banks—they both create money and make loans—has had considerable influence on the development of monetary theory. One example is the confusion that long existed over the expansion of deposits. Bankers used to deny that they created deposits: from their point of view, deposits created by expanding loans were withdrawn by the borrowers and disappeared from the books of the lending bank. The question was finally resolved by drawing a distinction between individual banks and the banking system, as is now commonplace in money and banking textbooks.

The double function of commercial banks also lies behind the uneasy coexistence of two approaches to monetary theory and policy. One, the quantity-theory tradition, emphasizes the supply of and demand for the stock of money. The other, a credit theory of money, emphasizes the effect of banks on the supply of loanable funds. The two approaches are not theoretically incompatible. They fit together consistently in a general description of long-run equilibrium. In the analysis of changes in the money stock and credit, however, they give rise to different and often opposing interpretations.

The quantity-theory tradition focuses on the adjustments of the public to a change in money balances. Portfolio theory, which describes the allocation of tangible wealth among various alternative assets, is the modern development of this tradition. The adjustments in portfolios to a monetary change ultimately affect all dollar values in the economy but initially have important effects also on interest rates.

The portfolios of banks are also disturbed by a monetary change, but in this tradition the particular financial assets acquired by banks in expanding deposits are not important in determining the amount and the speed of the effect on aggregate expenditures.

For credit theories, however, the credit flows emanating from banks and other financial institutions are of prime importance. In this view the speed and direction of monetary effects depend upon the manner in which new money enters the economy. In one version of the credit effect, attributable to Wicksell, an expansion of bank credit adds to the total supply of real loanable funds and thus reduces interest rates, while by implication an expansion of the money stock by other means does not. It is sometimes argued further that monetary expansion affects aggregate expenditures more rapidly and more predictably if banks expand loans rather than investments. The rationale is that, since purchases of existing securities change only the composition of the public's portfolios, the effect on expenditures is slow and uncertain, while loans put money into the hands of households and businessmen who intend to spend it immediately.

The quantity and credit theories often lie behind differing approaches to monetary policy. A recent example was the "bills only" controversy of the early 1960's, in which the issue was whether the Federal Reserve should conduct open-market operations in long-term bonds rather than in Treasury bills, as was usual. The opponents of "bills only" followed a credit-theory approach. They argued that operating in bonds would more directly affect long-term interest rates. Allegedly, investment expenditures would respond more quickly. Then open-market operations would have a speedier and greater impact on aggregate expenditures. This argument emphasizes the first-round effects of changes in the money stock.[1] The quantity-theory tradition, on the other hand, attaches little importance to the first-round effects. By implication, the Federal Reserve's choice of securities to buy or sell has little impact on aggregate expenditures.

Another example of the influence of credit theories is the long-

[1] There would, of course, be further effects in the first round as banks expanded or contracted in response to the change in bank reserves. The way in which banks respond is largely beyond the control of the Federal Reserve, however, and was disregarded in the "bills only" discussion.

standing reliance on particular "credit market conditions" to indicate the immediate effects of monetary policy. These conditions include money market interest rates as well as the terms and availability of credit in major financial markets. One rationale given for this emphasis is that the main channels of monetary effects on the economy are the credit flows through financial institutions. In the quantity-theory approach, however, interest rates and other credit conditions are only one channel of monetary effects. The portfolio adjustments set in motion by a change in money balances can work through a variety of channels rather than exclusively through the credit flows of financial institutions. Portfolio adjustments also affect credit markets, as one among various sectors, but not in the narrow sense of always having a particular impact.

THEORETICAL ANALYSIS OF THE CREDIT EFFECT

These two approaches to monetary theory and policy imply a different pattern of monetary effects on interest rates, though the differences between the two are often blurred in the literature. The differences are emphasized in the present study so that their separate roles in monetary disturbances can be tested.

The starting point is a theoretical analysis, in Chapter 2, of an important proposition underlying most credit theories, namely, that an expansion of bank credit adds to the total supply of real loanable funds and therefore affects real saving in the economy. The explanation usually given is that the operating procedures of financial institutions produce "forced" saving, overriding household preferences which determine the desired additions to wealth.

An alternative is to view bank credit expansion as the revenue from creating money, and to ask what determines the amount of the revenue in real terms and whether its beneficiaries increase their saving rather than their consumption. The analysis of the first part of Chapter 2 leads to the conclusion that lack of free entry into banking and of full competition in attracting depositors allows deposit expansion to produce a revenue. Yet institutional practices do not require that it produce increased real saving in the economy. If the beneficiaries of the revenue,

the banks' stockholders, view the revenue as income, they will probably want to consume most of it—not save it. They can control their total saving even if the revenue is not paid to them as dividends but is retained by the banks.

Nevertheless, it is likely that stockholders will save unanticipated increases in the revenue from deposit expansion. Consequently, unanticipated short-run variations in deposit growth may tend to produce some corresponding variations in the supply of real loanable funds and opposite variations in interest rates, while long-run anticipated rates of growth will tend not to.

STATISTICAL ANALYSIS OF THE EFFECTS

A 1966 study of mine found that the U.S. data do in fact show an inverse association between interest rates and the rate of growth of the money stock. A modified version of that work was presented here in Chapter 3. The association raises an important question for monetary theory: "Does the association reflect the credit or the portfolio effect or in part both?" The only other plausible explanation of the association is the reverse effect of interest rates on monetary growth, but this alternative was examined and found to be untenable. It would most likely produce a positive association, if any at all.

In Chapters 4 and 5, a statistical analysis was developed to test the portfolio and credit theories by the implied effects on interest rates. Interest rates were regressed on two variables representing two sources of monetary growth. One source was monetary growth associated with credit expansion of the monetary system. (Treasury debt operations can be either consolidated with Federal Reserve Bank operations or excluded, depending upon how broadly the "monetary system" is defined. The analysis alternately used both definitions.) The second source was all other components of monetary growth—those not associated with credit expansion of the monetary system, such as gold flows and Treasury budget deficits financed by creating money. The regression of interest rates on the two main sources of monetary growth indicated the extent to which each one accounted for the inverse association. By the credit theory the first source would account for all of the inverse association with interest rates, and the

second source for none. By the portfolio theory both sources would account equally for the association, since all sources of monetary growth are supposed to affect interest rates.

The results showed that the portfolio effect accounts for most or all of the association. The credit effect measured separately was usually not statistically significant, whereas the portfolio effect uniformly was.

Various estimates of the regression coefficient of the credit variable consistently suggest that its additional effect is not zero, however, even though most of the individual estimates are not statistically significant. Taken all together, these estimates provide tentative evidence that the credit effect has an independent existence. According to the estimates, new money has a greater *initial* effect on interest rates, if it enters the economy through an expansion of credit, of about 10 to 40 or 50 per cent. Additional analysis suggests that Federal Reserve credit by itself may account for much of this effect. A larger effect for Federal Reserve credit than for bank credit is consistent with the theoretical proposition that credit expansion by the government is not offset by the public, whereas that of commercial banks is to some extent offset by stockholders or depositors.

The credit effect, therefore, is considerably smaller than the portfolio effect for the intermediate-run periods tested here, and for longer periods the credit effect is presumably even smaller. The first-round effects of money creation associated with an expansion of credit are but the tip of an iceberg. The initial impact on particular financial markets is outweighed by the subsequent rounds of portfolio adjustments. Monetary growth produces an effect on interest rates no matter how the new money is created. The effects are therefore not confined to particular markets but range widely throughout the economy.

THE SEQUENCE OF MONETARY EFFECTS ON INTEREST RATES

The portfolio effect can be interpreted as a gradual adjustment to a discrepancy between actual and desired money balances. This process was analyzed theoretically in Chapter 6 and statistically in Chapter 7, and can explain most of the inverse association between interest rates and monetary growth.

The effect is not permanent. The discrepancy leads to adjustments involving purchases and sales of financial and real assets which affect aggregate expenditures and thus the amount of money balances demanded. The effect on money demand tends to erase the discrepancy and thus to bring real interest rates back to their initial level. Nominal interest rates continue to adjust, however, presumably until they fully compensate for the anticipated rate of price change.

According to the model of the portfolio effect developed in Chapter 6, monetary effects on interest rates are accompanied by a corresponding sequence of effects on aggregate expenditures. Following a monetary disturbance, interest rates initially respond inversely to the disturbance, but later reverse direction and return to their original level. The turnabout and return take place because aggregate expenditures are also responding to the disturbance. This response reflects an effect on borrowing for investment expenditures and on direct expenditures for goods as part of the adjustment of portfolios. The model therefore provides a rationale for equations of the St. Louis type, which relate changes in aggregate expenditures to current and lagged monetary growth.

Statistical analysis of the lag pattern supports the sequence implied by the model. The pattern for the commercial paper rate shows an initial inverse movement and subsequent reversal. The return movement goes further than the initial level, apparently reflecting the Fisher effect of the anticipated rate of price change. The lagged effect on aggregate expenditures exhibits overshooting, which in the model is due to an initial change in the ratio of money to income followed by a return to the equilibrium level. Overshooting is greater if desired money balances depend upon permanent rather than current income.

These lag patterns are crucial for the proper conduct of monetary policy. An emphasis on the credit effects of monetary policy has tended to foster the view that its effects occur relatively quickly, whereas the portfolio effects are consistent with a delayed adjustment and lags in monetary policy. The estimates suggest that the initial inverse effect lasts one to two quarters or so, and that interest rates then reverse direction and pass their original levels in three to five quarters. Overshooting in the accompanying adjustment of aggregate expenditures obviously adds to the difficulties of monetary policy in varying monetary growth to stabilize the economy.

SOME IMPLICATIONS FOR POLICY FORECASTS AND INDICATORS

Econometric Models

In many econometric models of the economy, monetary effects are measured indirectly by means of interest-rate variables. Interest rates enter into asset demand, credit demand, and supply equations for these markets. The money stock influences interest rates through the demand function for money balances, and interest rates in turn influence investment expenditures. A common criticism of these models is that the small number of quoted interest rates covered may not represent the full range of portfolio adjustments. Also, quoted rates may not reveal the "true" cost or return to lending along certain channels, and those rates may not adequately represent the variety of channels through which changes in borrowing and expenditures occur. In consequence, monetary effects on aggregate expenditures may be understated.

One can sidestep the statistical problem of coverage by incorporating monetary adjustments directly into the equations. One procedure is to put the discrepancy between actual and desired money balances into the expenditure equations. That is highly dependent upon an accurate estimate of desired money balances, however, and is not likely to be successful. An alternative is illustrated by the solution to the simplified model of Chapter 6. This relates expenditures to current and past rates of change in the money stock. The inclusion of lagged monetary growth in expenditure equations may help to catch monetary effects not adequately represented by interest rates and by approximations to the terms and availability of credit.

The rationale for making expenditures depend upon monetary growth rather than the growth of a broader set of financial assets is that monetary growth largely occurs independently of the portfolio decisions of the public. There are, to be sure, unsettled questions about how exogenous to the economic system the various components of the money stock are. But, generally speaking, the reserves and demand deposits of commercial banks change independently of immediate market developments. Nowadays excess reserves remain at minimum working amounts, and the Federal Reserve does not, most of the time, allow borrowed reserves to influence for long the level of total re-

serves intended by policy. Consequently, the exogenous supply factors largely determine the quantity of deposits outstanding, and currency outstanding grows steadily and does not produce important variations in growth of the total money stock. Portfolios then adjust to changes in the supply of money. Other financial assets, on the other hand, cannot be issued as a medium of exchange, but are created by inducing someone to acquire them. A change in their rate of growth does not carry the same significance for expenditures as does a change in monetary growth.

Another characteristic of many econometric models concerns their treatment of monetary effects on interest rates. These effects are most often explained in terms of a demand function for money balances dependent upon the level of interest rates and aggregate expenditures. (Dollar magnitudes should theoretically be in real terms, but are often measured in nominal terms.) It is generally assumed in the models that portfolio adjustments are rapid, so that actual and desired money balances can be taken as always equal. Then the equation, simultaneously with the rest of the model, helps determine the level of interest rates.

As a method of estimation this differs radically from the regressions reported in Chapter 7 between the level of interest rates and past *rates of change* of the money stock. The derivation of the equations is also different. The model of Chapter 6 described monetary effects on interest rates in terms of a discrepancy between desired and actual money balances. On the assumption that portfolio adjustments take time, discrepancies reflect past changes in the rate of change of the money stock.

Despite the dissimilarity of the estimation methods, they can be given a common interpretation. In the Chapter 6 model, desired money balances were represented as a function of the interest rate and aggregate expenditures. This function can be substituted for desired money balances in the equation relating the interest rate to the discrepancy between actual and desired balances. When solved for the interest rate, this gives a relation between the interest rate, the money stock, and aggregate expenditures—the same way as in the econometric models described above. While the method of Chapter 6 estimates the discrepancy between actual and desired money balances from changes in

monetary growth, the econometric models can be interpreted as measuring the discrepancy directly by the use of actual money balances and an estimate of desired balances, the latter based on predicted values of aggregate expenditures derived from the whole model. Hence the difference between these estimation methods is in the application rather than the basic theory, though the interpretation of regression coefficients will be different.

An interest-rate equation using aggregate expenditures as a proxy for desired money balances gives a good fit, in large part because it accounts well for long-run movements in the variables. But this does not mean that it properly describes short-run movements in interest rates. Actually, such an equation in first-difference form does poorly. Small errors in estimates of desired money balances by this method can produce large percentage errors in the discrepancy between actual and desired balances, as was noted earlier. The accuracy of this method of explaining interest rates and that of Chapters 6 and 7, which is based on past rates of monetary growth, cannot be properly assessed from correlation coefficients but only from *ex ante* predictions, when the monetary growth path alone is assumed to be known. Then the two are on an equal footing, and such a comparison of their comparative predictive powers would provide a further test of the Chapter 6 model.

These models can only be of value in explaining short-run changes in interest rates, since monetary changes will have no long-run effects on real rates of interest.

Compartmentalized Financial Markets

The importance of credit effects is commonly thought to derive from separate "compartments" in financial markets, whereby credit channeled into particular markets cannot easily "escape" to take advantage of more attractive returns elsewhere. It is alleged, for example, that a rapid rise in interest rates hampers a free flow of funds into the mortgage market because of institutional restraints. Policies to divert funds into the mortgage market and elsewhere have therefore been pursued in times of monetary restraint, on the assumption that if funds are channeled there the market receives largely the same supply from other sources and ends up with a larger total supply.

The results of this study do not deny the existence of institutional

restraints over the flow of funds into particular financial markets. Legal constraints, risk of default, and investment policies of financial institutions, along with elasticities of demand, undoubtedly affect certain interest rate differentials and the quantity of funds supplied for particular purposes, though it does not follow that all funds supplied to an allegedly compartmentalized market are unable to flow elsewhere.

The findings of this study nevertheless bear on this issue, because they show that the first-round effects of monetary policy are a fairly small part of the total effect, whether the recipient markets are compartmentalized or not. It was also found that loans and investments of the banking system have little differential effect on loan rates and security yields. Most of the total effect on credit depends upon portfolio adjustments in subsequent rounds, which spread out into a variety of channels over which the initial lender has no control. These adjustments will outlast and swamp any initial credit effects of money creation on interest rates and aggregate expenditures. This means that bank credit is basically a poor guide to the effects that a particular monetary policy will have on the economy. Indeed, the main conclusion of this study is that monetary effects on interest rates and the economy at large depend primarily upon the quantity of money created and not upon the particular credit channels taken by the injection of new money.