Credit Aggregates as Policy Targets

In recent years, financial innovations have raised questions about the usefulness of narrowly defined money as a policy target. The establishment of nationwide NOW (negotiable order of withdrawal) accounts, the rapid growth of money market mutual funds, and, more recently, the creation of Federally insured money market deposit and super-NOW accounts have repeatedly altered the form in which the public holds transactions and savings balances. Because of the changing composition of the monetary aggregates, the relationship between GNP and those aggregates—especially narrowly defined money—have become less certain. As a result, the usefulness of monetary measures in general, and M-1 in particular, has declined in recent years. Furthermore, the difficulty with money likely will continue during the transition period of adjustment to the new accounts.

In such an environment, it may be worthwhile for policymakers to look at other financial measures in addition to the monetary aggregates. Credit aggregates are one kind of potential alternative. This article summarizes existing evidence on the relationship between GNP and credit. In addition, it investigates how the reaction of policymakers might have been different in the past if the Federal Reserve had targeted credit along with money. Such an analysis can provide some clues to the effectiveness of monetary policy in the future if a credit aggregate is added as a target.

Our main finding is that there is no evidence from the past suggesting that weighting credit more heavily in the policymaking process would have resulted, on balance, in a path of GNP more desirable than the one actually experienced. However, this result should be viewed cautiously with regard to its implications for the future. Because the economy can change as a result of financial innovations, past relationships may not be reliable indicators of current or future behavior. Moreover, correlations also can change just because the Federal Reserve places more emphasis on a variable than it did in the past. Furthermore, conceptual considerations suggest that, in times of substantial shocks to the components of broad monetary aggregates, targeting credit or broad money instead of narrow money may result in smaller fluctuations in GNP.

Conceptual issues

Until recently, conceptual models investigating what variables monetary policy should target considered only the choice between targeting interest rates and the money stock. More recently, a number of analysts have pointed out that one should also consider aggregates from the liability side (*i.e.*, credit aggregates) of the balance sheet of the nonbank public. However, the few models developed in the past several years that do incorporate credit unfortunately have not been able to provide any general conclusions on whether money, credit, or the interest rate is best suited for policy targets.[1] The general problem is that in some situations economic theory suggests that

[1]See, for example, Franco Modigliani and Lucas Papademos, "The Structure of Financial Markets and the Monetary Mechanism" (Columbia University Discussion Paper No 90, February 1981), and Andrew Silver, "Choosing Among Narrow and Broad Monetary and Credit Aggregates An Evaluation of 'The Structure of Financial Markets and the Monetary Mechanism', by Modigliani and Papademos" (Federal Reserve Bank of New York Research Paper No 8110, June 1981)

money would be superior to credit as a policy target; in other situations, however, credit would be preferred. Thus, to choose optimal policies, it is necessary to understand which of the various theoretical situations best approximates the economy and then to tailor policy accordingly. For example, assume that the only uncertainties about the economy were the random shifts that could occur between two components of a broad monetary aggregate (say, between M-1 and money market mutual funds). Then, controlling one of those components (*e.g.*, M-1) would be inferior to controlling a credit aggregate or a broad money aggregate, both of which would be stable under this assumption. On the other hand, suppose the demand for money were stable and interest inelastic but the level of credit demand was uncertain (due, *e.g.*, to shifts in investment spending between firms that typically depend extensively on credit and those that do not) In this case, controlling M-1 would be better than controlling credit [2]

The obvious problem for the policymaker in interpreting these results is that the actual structure of the economy cannot be categorized easily as belonging to either of these special cases or, for that matter, to any special case. In a world in which random shocks occur to the components of money and credit demand, as well as to other sectors, the policymaker needs to know the expected magnitudes of all those random occurrences. In addition, it is necessary to know how all economic agents respond to changes in the economy to understand how the shocks are transmitted from market to market. Unfortunately, existing empirical models are not complete enough to provide the necessary estimates.

Despite lack of such precise knowledge, if it is true that shocks to the monetary measures resulting from financial innovations are increasing relative to those affecting the credit aggregates, then this relative increase in uncertainty about the monetary aggregates probably moves us closer to a situation in which a credit target may be superior to a money target. In such a situation, attention to a credit aggregate in addition to the usual concern with the money aggregates may guide us to policies that are better (or at least no worse) than policies that focus exclusively on money.

Empirical evidence

It is apparent from the previous discussion that the case for a credit target, either instead of or in addition to a money target, is not strong enough to be made exclusively on conceptual grounds. Even if we fully understood qualitatively how disturbances in any particular market were transmitted to other markets in the economy, it would still be necessary to estimate empirically the magnitudes of various transmission mechanisms In view of the complexities inherent in the economy, such a detailed estimation of the structure of the economy is extremely difficult.

An alternative to trying to identify and to estimate the relevant links among the various markets for money, credit, and output is to focus an empirical analysis on a very small subset of economic variables. This approach has been used recently in numerous studies in an attempt to sort out the impacts of money and credit on output

The results from these "reduced-form" studies are very sensitive to the time period under consideration, the particular sets of variables in the analysis, and the form in which the data are analyzed.[3] Consequently, these studies often show conflicting results In some, credit measures do better in explaining movements in nominal GNP, or prices, or real output than do monetary measures, while in others, money does better. Furthermore, interest rates were shown to affect the relationships among the variables in ways that raise the question of whether either money or credit is linked directly to the ultimate goals of monetary policy—price stability and output growth. The basic conclusion from these empirical findings, therefore, is a rather weak one: because of the lack of a consistent and durable set of empirical results, the relative usefulness of money and credit as policy targets cannot be determined on the basis of such evidence. We will now review some of these results, and the underlying methodologies, that have led us to this conclusion.

Much of the discussion on the use of credit aggregates has concentrated upon three different financial measures: bank credit, formerly an associated policy target; the debt proxy, an aggregate recommended by Henry Kaufman;[4] and nonfinancial domestic credit, a variable proposed by Benjamin Friedman.[5] Bank credit is the narrowest measure of the three and consists of loans and investments of commercial banks; the debt proxy represents financial claims held by the

[2] Silver, "Choosing Among Narrow and Broad Monetary and Credit Aggregates".

[3] For example, different results are obtained if one uses end-of-quarter data or averages of adjacent end-of-quarter data See E K Offenbacher, R D Porter, and E F McKelvey, "Empirical Comparisons of Credit and Monetary Aggregates Using Vector Autoregression Methods", mimeographed (Board of Governors of the Federal Reserve System, July 1982)

[4] Henry Kaufman, Testimony before the House of Representatives Committee on the Budget, February 6, 1978

[5] Benjamin Friedman "Time to Reexamine the Monetary Targets Framework", *New England Economic Review* (Federal Reserve Bank of Boston, March/April, 1982)

nonfinancial domestic sectors, and nonfinancial domestic credit represents credit market funds raised by all domestic nonfinancial sectors, including local, state, and Federal government units.[6] Detailed definitions of these aggregates are provided in the box on page 6.

The point of departure for a variety of studies investigating the credit-GNP relationship[7] is the striking constancy of the ratio of income to each of several broad credit aggregates, *i e*, constant income velocities (chart). Indeed, at face value, this constancy suggests that GNP can be accurately controlled if sufficiently close control over credit is maintained. Nonetheless, a velocity which is trending but predictable would be just as helpful to the policymaker as a velocity which is constant. What is important from a policy viewpoint are the sizes and predictability of the fluctuations around the trend of velocity However, when one adjusts the velocities for their trends and respective means, there is not much difference in the variability of the financial aggregates under discussion (Table 1).[8]

Since the income velocity of a financial aggregate is the ratio of nominal GNP in a particular period to the value of the financial aggregate in that same period, a further shortcoming of an analysis of velocities is that time lags are ignored To allow for time lags in a simple way, researchers have run equations in which GNP is regressed on both current and lagged values of the financial variables of interest.

These types of relationships between GNP and M-1, as well as those between GNP and the credit aggregates similar to those described above, have been investigated previously by Richard G Davis[9] Each pair of variables was analyzed by regressing GNP growth on a weighted average of current and four lagged growth rates of the respective financial aggregates and by regressing GNP growth on a weighted average of only the lagged growth rates of the various financial variables The latter type of regression, which excludes values of the financial aggregates contemporaneous to the dependent variable, is used to reduce the ambiguities with regard to the "causality" in the relationships between the variables, thus, attention is focused upon whether current GNP movements are determined strictly by *prior* movements in the explanatory variable

Table 1
Coefficients of Variation of Velocities: Money and Credit Aggregates*
1960-I through 1982-I

Velocities	Raw data	Detrended data
M-1	0 205	1 20
Bank credit	0 058	1 32
Debt proxy	0 015	1 17
Nonfinancial credit . .	0 013	1 22

* The coefficient of variation is defined as the standard deviation divided by the mean

In his analysis, Davis studied the 1961-I through 1977-IV period as well as the 1961-I through 1969-II and 1969-III through 1977-IV subperiods He found that, when contemporaneous values of the financial aggregates were included, the debt proxy provided the most explanatory power for GNP (a multiple correlation coefficient of 0.35) over the full sample period M-1 provided slightly less explanatory power, followed by total credit[10] and bank credit (which explained only 4 percent of the GNP variation) In each of the two subperiods, the debt proxy also explained a substantial portion of GNP movements, however, total credit provided the most explanatory power in the 1970s (39 percent)

Benjamin Friedman reports similar results from investigating the relationships between GNP and various credit and monetary aggregates in similar types of equations, broad credit aggregates do about as well as M-1 in explaining GNP[11] Friedman found, however, that the explanatory power of all the aggregates, including the broad credit aggregates, declined sharply in the 1970s[12]

[6] Nonfinancial domestic credit measures the liabilities of particular sectors, while the debt proxy and bank credit measure the assets of various agents Nonetheless, for the purposes of this article, we will refer to all three of the aggregates as "credit" aggregates

[7] Specifically, Richard G Davis, "Broad Credit Measures as Targets for Monetary Policy", this *Quarterly Review* (Summer 1979), Frank E Morris, "Do the Monetary Aggregates Have a Future as Targets of Federal Reserve Policy?" *New England Economic Review* (Federal Reserve Bank of Boston, March/April 1982), and Benjamin Friedman, "Time to Reexamine the Monetary Targets Framework"

[8] A useful graphical comparison of variability in the M-1 and debt proxy velocities, for example, is in Davis, "Broad Credit Measures as Targets for Monetary Policy", page 17

[9] Davis, "Broad Credit Measures as Targets for Monetary Policy"

[10] Davis's measure of total credit is similar to what we have called nonfinancial domestic credit, but his measure excludes Federal Government borrowing

[11] Benjamin Friedman, "The Roles of Money and Credit in Macroeconomic Analysis", mimeographed, September 1981

[12] In contrast, Davis found that the explanatory power of total credit rose in the 1970s as compared with the 1960s and that the explanatory power of the debt proxy was about the same in the two periods Possible explanations for this discrepancy include the form of the lag distribution, presence of other explanatory variables, and different estimation periods and definitions of variables

Further, it has been found that excluding the contemporaneous values of credit aggregates from the regressions results in a sharp drop in the ability of these measures to explain income [13] Analogous results were found by Davis for total credit as well as for M-1 and the debt proxy When only lagged values of these financial aggregates were used, the aggregates' explanatory power for GNP declined dramatically in the 1970s

This type of equation has been criticized by econometricians In particular, in these equations the temporal relations between GNP and the financial aggregates are constrained to run from money or credit to GNP. Of course, such a constraint may not be valid; it may be that GNP changes, in fact, precede credit changes or that the two are jointly determined If the data are inappropriately constrained, then unreliable estimates of the financial aggregate-GNP relationship may emerge [14]

In part due to the potential problems associated with inappropriately constraining the temporal relations among variables, a new statistical technique—vector autoregression—recently was developed to help avoid imposing such incorrect constraints. This technique is in many ways a natural extension of the simpler methodology referred to above The technique allows each variable to depend potentially upon prior values of all the variables under analysis.[15] For example, GNP would be regressed on prior values of itself as well as prior values of the financial variable(s) of interest Davis also ran equations of this type.[16] He found that, when lagged values of either M-1 or the debt proxy were added to lagged values of GNP, the explanatory power for current GNP improved significantly Neither bank credit nor total credit, however, provided similar contributions in explanatory power

Other analyses using the general vector autoregression technique often distinguish explicitly between the real and price components of nominal GNP. This distinction between the real and price components allows for analysis of issues such as whether financial aggregates directly influence real output or prices, or both For example, if it is found that some financial aggregate is linked directly to prices, but not to output, then that aggregate might be a candidate as an intermediate

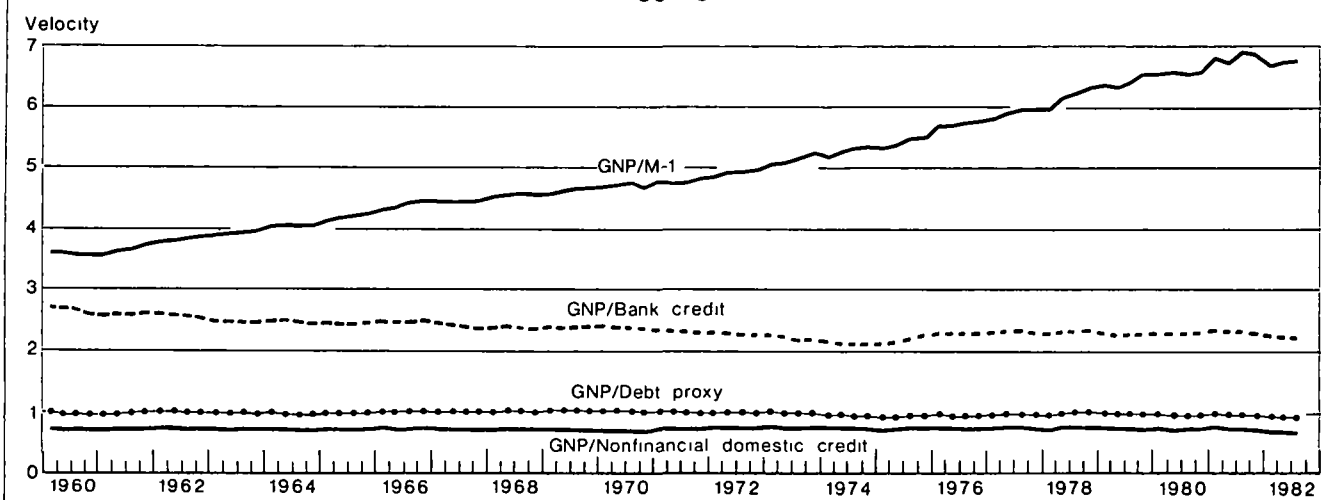
[13] James Fackler and Ken Guentner, "Money, Credit and Income", mimeographed (Federal Reserve Bank of New York, January 20, 1982)

[14] For an exposition of the biases inherent in ignoring feedback from the economy to policy variables in the context of a structural model, see S M Goldfeld and A S Blinder, "Some Implications of Endogenous Stabilization Policy", *Brookings Papers on Economic Activity* (3, 1973)

[15] Vector autoregression is so named because it investigates the relationship between a set of current variables (*i e* , a vector) and prior values of that set of variables (*i e* , an autoregression)

[16] However, Davis did not provide a full vector autoregression analysis since analogous equations explaining the financial aggregates were not simultaneously estimated

Income Velocities of M-1 and Various Credit Aggregates



Sources Board of Governors of the Federal Reserve System, United States Department of Commerce, Bureau of Economic Analysis

Definitions of Selected Credit Aggregates

Bank credit	Commercial bank holdings of Federal and state and local government obligations and total bank loans. These include mortgages, consumer credit, agricultural loans, open market paper, commercial loans, loans to other financial institutions, and loans to foreign banks.
Debt proxy	Holdings by private domestic nonfinancial investors of currency, checkable deposits, large and small time deposits, money fund shares, repurchase agreements, Federal Government securities, state and local government obligations, open market paper, corporate and foreign bonds, and other loans.
Nonfinancial domestic credit	Credit market funds raised by nonfinancial sectors, including funds raised by Federal, state, and local governments, corporate bonds, mortgages, consumer credit, and open market paper.

target in a policy aimed at controlling inflation.

An analysis of the temporal relations among real GNP, prices, and money has shown that lagged values of money (M-1) help explain prices, but not output.[17] When a broad credit aggregate (nonfinancial domestic credit) is substituted for M-1, so that the set of variables under consideration includes output, prices, and credit, then credit, like money, explains prices but not output.[18] When sets of lagged values of both M-1 and credit are included in an equation explaining prices, however, neither set is individually significant. This suggests that M-1 and credit contain similar information for future prices, and therefore both are not necessary to explain prices. On the other hand, when M-1 and credit are included in an equation explaining output, both financial measures are significant.[19] Therefore, information on money and credit possibly can be combined usefully in determining future output.

However, when the rate of interest is substituted for credit in a four-variable analysis (*i.e.*, output, prices, money, interest rate), money is no longer directly important for explaining output.[20] Money, however, does retain importance for explaining prices. Furthermore, in a five-variable analysis (*i.e.*, money, credit, the rate of interest, output, and prices), the interest rate helps explain movements in output and prices. But, while money and credit explain some of the variations in the interest rate, neither financial aggregate directly influences prices, a result similar to the four-variable case referred to above. In addition, neither money nor credit appears to contribute directly to the determination of output; this is a markedly different result from the one obtained when the interest rate is excluded.[21] The interest rate, therefore, appears to be an important but heretofore relatively ignored variable in studies of the relationships among money, credit, prices, and output. The complete set of relationships needs to be explored and explained further before the target question can be resolved.

Would credit aggregates have helped policy in the past?

Although the Federal Reserve monitored a variety of economic and financial indicators in deciding upon monetary policy in the past, M-1 was usually the primary aggregate used in the period since 1970. In this section, we look at whether giving more weight to credit would have resulted in a "better" monetary policy. That is, would more attention to credit have resulted in reactions by policymakers that would have

[17] In addition, both lagged output and lagged prices influence the current stock of money, so that significant feedback from the economy to money exists. One implication of this result is that single equation models may inappropriately constrain the income-money relationship to one in which changes in money temporally precede changes in income.

[18] Whether money or credit is used as the explanatory variable in the output and price equations makes very little difference in the explanatory power, as measured by the coefficient of multiple determination ($\bar{R}^2$) and the standard error. (See Benjamin Friedman, "The Roles of Money and Credit".) In the systems of three-variable equations referred to above, neither money nor credit is significant at the 10 percent level in explaining output. In the price equations, money is significant at the 1 percent level, but credit is significant only at the 5 percent level.

[19] These results, along with those in the preceding paragraph, are presented in Friedman, "The Roles of Money and Credit." The $\bar{R}^2$s and the standard errors of the equation in the system including both M-1 and credit are essentially the same as those in the systems that include only one of the financial variables. The exception is that the standard error of the output equation is slightly lower in the system that includes both financial variables.

[20] For instance, Friedman, "The Roles of Money and Credit", and Christopher Sims, "Comparison of Interwar and Postwar Business Cycles: Monetarism Reconsidered", *American Economic Review* (May 1980).

[21] See James Fackler, "An Empirical Model of the Markets for Money, Credit, and Output", mimeographed (Federal Reserve Bank of New York, revised December 1982).

led, on balance, to a better performance, in terms of output and inflation, since 1970?[22] The answer, we find, is that it probably would have not.

To see if a joint M-1 and credit target would have resulted in a better policy than one based on money alone, it is first necessary to determine when those two policies would have been different. That determination depends on how policymakers were to incorporate credit into the decision-making process. One possible way would be to make decisions based on M-1 alone as long as the signals emanating from M-1 and credit were not very different. That is, one could assume that there is some "normal" or "average" relationship between M-1 growth and a particular credit aggregate growth and that some variation around this relationship is to be expected and not to be viewed as "unusual" in any policy-oriented sense. When the signals were very different, though, policymakers would weight those conflicting signals and adjust policy accordingly.

For example, if credit growth greatly exceeded money growth, the credit aggregate would indicate that a "looser" policy was actually being employed than if policymakers looked just at money growth. Hence, to achieve a given desired goal, policy would be tightened, either by raising interest rates or by reducing nonborrowed reserves, relative to the situation in which money was used as the sole indicator. This relative tightening would occur whatever the policymakers' reaction would have been to money growth alone. If money growth was deemed unsatisfactorily low, policymakers, looking only at M-1, might react by loosening policy; looking at credit (growing rapidly) in addition to money (growing slowly), they might still loosen but loosen less. On the other hand, if money was growing faster than desired or anticipated, policymakers might tighten policy. Adding credit as a target in this situation would lead policymakers to tighten even more. Analogously, when credit growth was "abnormally" low relative to money growth, the indication would be that policy was tighter in fact than that signaled by money alone; hence, taking credit growth under consideration would lead to a relatively looser policy

Table 2 shows the periods in which such a joint policy of M-1 and each of the credit aggregates, respectively, would have been different from one based solely on M-1 The specific criteria used to judge when the relationships between the growth rates were "abnormal" were differences between the four-quarter growth rates of M-1 and the credit aggregates of more than two standard deviations.[23] For those periods in which "abnormal" differences in growth rates existed, and hence a joint target-based policy would have been different from an M-1 based policy, we have indicated the direction of the difference in resulting policies. That is, if policy would have been more expansionary using a joint target, the term "looser" has been entered in the appropriate column; if policy would have been more contractionary, the term "tighter" has been used. We have not indicated the exact magnitudes of the resulting policy shifts because to do so would require precise knowledge of, or assumptions regarding, how policymakers would have weighted conflicting signals given by M-1 and credit. However, as long as credit is given some weight, we can determine the direction of policy change. Furthermore, we have looked only at short-run changes in policy. Any hypothetical policy that differs from the historical record would have affected the entire subsequent evolution of the economy, at least partly due to the reaction of subsequent policy. However, the study of such potential long-run responses is beyond the scope of this article.

While it is relatively easy to determine when policy would have been different, as well as the direction of those differences, it is much harder to conclude whether the alternative policies would have been an improvement over actual policy. Both economists and policymakers have widely divergent opinions on the efficacy of monetary policy on inflation and real economic activity, on the timing of any influence that does exist, and on the relative costs of inflation and sacrifices in real output. Therefore, in evaluating the joint target policies, our conclusions are limited to those cases in which we view the evidence as overwhelming. Even so, we recognize that those conclusions are by no means the only ones that could be reached. To help readers follow our analysis of the alternative economic policies and to aid in the formation of independent judgments, we have listed the quarterly growth rates (at annual rates) of real GNP and consumer prices in the last two columns, respectively, of Table 2.

Nonfinancial domestic credit

A joint target of nonfinancial domestic credit and M-1 would have created a policy different from a strict M-1 target in three periods In the first period, 1973-III through 1973-IV, nonfinancial domestic credit was

[22] For expositional simplicity, we refer to actual policy in the post-1969 era as an M-1 based policy and to a hypothetical policy, with more weight on credit, as a joint M-1 and credit policy

[23] The mean and standard deviation for a given quarter were calculated from the data for the five years prior to that quarter Thus it is assumed that, given the changing relationships in an evolving economy, policymakers would have looked only at the five most recent years of behavior in evaluating signals in a given quarter

Table 2

Differences in Policy Signals between M-1 and Credit

Year-quarter	Policy change indicated by: Nonfinancial domestic credit	Debt proxy	Bank credit	Real GNP (Quarterly growth, at compound annual rate)	Consumer price index (Quarterly growth, at compound annual rate)
1970-I			Looser	−1 54	6.70
1970-II			Looser	0 59	5.73
1970-III				3 86	4 45
1970-IV				−3 11	5 94
1971-I				10 26	3 30
1971-II				1 96	3.84
1971-III				3 19	3.92
1971-IV				3 49	2 87
1972-I				7 90	3 63
1972-II		Tighter	Tighter	7 57	2 50
1972-III				5 05	3 36
1972-IV				7.48	4 20
1973-I				10.96	6 34
1973-II			Tighter	0 48	8 42
1973-III	Tighter	Tighter	Tighter	2 43	8 14
1973-IV	Tighter	Tighter		3.32	10 53
1974-I		Tighter		−3 98	12 57
1974-II				0.45	10.86
1974-III				−2 49	11 87
1974-IV				−5.19	13 37
1975-I				−8.19	8.56
1975-II			Looser	4 94	4 48
1975-III			Looser	9.23	8 55
1975-IV			Looser	3 64	8 11
1976-I				9.11	4 33
1976-II				2 74	3 22
1976-III				2 31	6 55
1976-IV				3 74	6 28
1977-I				8 87	7.39
1977-II			Looser	6 72	7 26
1977-III			Looser	6 77	5 58
1977-IV			Looser	0 75	5 96
1978-I				3 38	7 38
1978-II				11 00	9.42
1978-III				3 33	9 28
1978-IV				5.52	10 01
1979-I				1.15	10 61
1979-II				−0 92	12 71
1979-III				4 82	13 69
1979-IV				0.73	14 10
1980-I				1 51	16 48
1980-II	Tighter	Tighter		−9 56	13 52
1980-III				1.66	7 62
1980-IV	Looser			4 33	12.83
1981-I	Looser			7 90	10 96
1981-II	Looser			−1 48	7.81
1981-III				2 20	11 81
1981-IV		Tighter		−5 27	7.80
1982-I				−5 11	3 16
1982-II				2 11	4 59
1982-III				0 00	7 60

growing much faster than M-1, so that, had credit been considered along with M-1, policy would have been tighter than it actually was. The arguments for the appropriateness of a tighter policy center around the rapidly accelerating inflation rate of the period and the high level of capacity utilization in various industries. On the other hand, some of the inflation was caused by rising food prices due to bad weather in the 1972-73 winter and, in the fourth quarter of 1973, by rising fuel prices due to the OPEC oil embargo. In addition, the lower rate of economic growth experienced in the final three quarters of 1973 (compared with the 1972-I through 1973-I period), if allowed to persist, may have eventually led to less inflationary pressures. Therefore, it is not clear what kind of policy change would have been desirable in the second half of 1973.

In the second quarter of 1980, nonfinancial domestic credit again would have led policymakers to tighten policy. Such an action, coming on top of the credit control program adopted in March 1980, may have intensified and extended the sharp drop in real GNP that occurred in the second quarter (9.6 percent at an annual rate). The benefit, of course, may have been an even sharper drop in the inflation rate than actually occurred from the first to third quarters of 1980.

The final instance in which nonfinancial domestic credit would have affected policy was in the 1980-IV to 1981-II period. Had the credit measure been followed during that period, policy would have been looser than the one actually employed. Although this may have moderated the subsequent fall in economic activity, a looser policy may also have resulted in less of an improvement in the inflation picture than was experi-

enced. Thus, it is not clear that a looser policy would have been desired.

Debt proxy

The joint target system based on the debt proxy measure of credit would have called for actions different from those based on M-1 alone in five different periods in the post-1969 era. In 1972-II the debt proxy measure signaled that policy was looser than indicated by money growth; hence, had policy been based at least partially on the debt proxy, policy would have been tighter. This, in fact, may have been a more appropriate policy to pursue, given the fact that the economy was in the midst of an extremely rapid expansion and at the beginning of a period of accelerating inflation.

A policy based on the debt proxy in the 1973-III through 1974-I period would have been similar to, and had the same problems as, one based on nonfinancial domestic credit. Furthermore, since the period of tighter policy called for by the debt proxy extended into the beginning of 1974, following that signal would have led to a tighter policy at the start of what was already developing into a very severe recession.

From 1977-II through 1977-IV a debt proxy-based policy would have been more expansionary than an M-1 based policy. At the time, the economy was expanding at a rapid rate, and a period of sharply accelerating inflation was about to begin. A looser policy, therefore, was probably not desirable.

In the second quarter of 1980 the debt proxy again would have led to the same change in policy as indicated by nonfinancial domestic credit, and thus would have had benefits and pitfalls similar to those described above. In addition, the debt proxy would have led policymakers to tighten policy in the fourth quarter of 1981, another period of very weak economic activity and slackening inflation.

Bank credit

A joint bank credit and M-1 target would have led to a looser policy than an M-1 target in the first two quarters of 1970. Although the economy was in a minor recession at that time, the relatively high rate of inflation may have made a more expansionary policy undesirable.

The next two periods in which bank credit and M-1 would have given divergent signals were in 1972-II and 1973-II through 1973-III. In both periods, bank credit would have led to a tighter policy. As in the case of the debt proxy, a tighter policy probably would have been appropriate in 1972-II. However, the same may not be true for the latter period, as noted above for nonfinancial domestic credit.

The final period in which bank credit and M-1 would have given different signals was from 1975-II to 1975-IV, when bank credit would have led to a looser policy. Given that this period marked the start of a vigorous economic recovery, coincident with a falling rate of inflation, it is not clear that any alternative policy would have been superior to the one actually pursued.

Summary

One possible argument on the part of proponents of credit aggregates is that, even if the credit aggregates on average do not "outperform" the monetary aggregates, they may in fact give important signals at critical points in the business cycle. However, the evidence described in this section does not support this argument. None of the credit aggregates described above would have consistently improved an M-1 based policy in the post-1969 period. Even in two of the three periods in which more than one credit measure would have led to the same modification in policy, those modifications may have led policy in the wrong direction. Furthermore, none of the aggregates indicated that a tighter policy should have been pursued during the most recent period of accelerating inflation, 1977 through the beginning of 1981. Finally, at points during the most recent contractionary period, nonfinancial domestic credit would have led to a relatively more expansionary policy, while the debt proxy would have called for a tighter policy; which policy modification would have been more appropriate is still an open question.

Conclusion

In our view, there is no strong empirical evidence from recent history supporting use of a credit aggregate. However, such a view is an insufficient reason for discarding proposals to use credit aggregates as policy targets. In particular, even though credit would not have unambiguously aided the policymaker at critical points of the business cycle, limited existing theoretical work suggests that, in periods of substantial shocks to money, credit targets are more likely to be useful policy targets. If the recent financial innovations are viewed primarily as distorting the monetary aggregates, then credit aggregates are likely to be relatively useful, at least until the shocks to money subside.

James Fackler and Andrew Silver