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Free Reserves in Monetary Policy Formulation

This article presents the results of a statistical analysis of the impact of free reserves on the growth of bank credit. The study concludes that when free reserves are placed in a proper framework that includes the strength of credit demands, they are a significant factor in explaining changes in member bank loans and investments.

SUPPLEMENT:

The U. S. Balance of Payments Deficit and the State of International Reserves

Remarks by Norman S. Fieleke, Asst. Vice President and Economist, at Area Bank Conferences conducted by the Federal Reserve Bank of Boston in September 1969.

Free Reserves in Monetary Policy Formulation

by Robert E. Knight and Paul S. Anderson

MONETARY POLICY has traditionally been criticized for its alleged unfortunate effects during certain periods; to cite examples, it has been blamed for bringing on recessions at some times and for fostering inflation at other times. In recent years, however, new types of criticism have appeared which are narrower in scope and rather technical. These involve monetary magnitudes, or indicators which critics assert the Federal Reserve either should, or should not, use in policy formulation. Net free reserves, which equal excess reserves of member banks less their discounting from the Federal Reserve, are one indicator whose use has been severely criticized and are the subject of this article.

Another indicator which has become an even more discussed issue in recent years is the growth rate of the money stock. The free reserves and money supply growth issues are related since one important question is: What, if any, impact does the level of free reserves have on the growth of monetary aggregates?

For many years free reserves have been used as one of the key indicators of the degree of monetary tightness or ease experienced by the banking system. Negative free, or net borrowed, reserves were believed to be contractionary since banks were expected to repay their borrowings from the Federal Reserve promptly. Conversely, high levels of free reserves have been considered a stimulus to bank credit growth because banks are not under pressure to repay borrowing to the Federal Reserve and can use unneeded excess reserves to expand loans and investments. A typical view about the role of free reserves in the monetary process is illustrated in the following quotation:

> In general, the net reserve position of banks is an important gauge of the pressures on bank reserves. When net free reserves rise, the result is an increased marginal availability of reserves, which the banking system can readily use to expand credit. But when member bank borrowings grow relative to excess reserves, credit expansion comes under restraint. In this process individual banks find extra reserves more difficult and expensive to obtain, and they come under increasing pressure to repay advances from the Federal Reserve.[1]

Even if the use of free reserves as a *gauge* of reserve availability were considered acceptable, they could still be used improperly if the demand for loanable funds were not fully considered in policy making. Thus, a certain level, say $500 million,

This article is based on a Ph.D. thesis, *Federal Reserve System Policies and Their Effects on the Banking System*, by Robert E. Knight at Harvard University, 1968. The thesis was written with financial aid from this Bank and will soon be available on request to the Research Department of the Bank, 30 Pearl Street, Boston, Massachusetts, 02106.

Dr. Knight is now a Financial Economist at the Federal Reserve Bank of Kansas City.

[1]Board of Governors, *Purposes and Functions of the Federal Reserve System* (5th ed; Washington: Federal Reserve System, 1963) p. 224.

of free reserves may have at times in Federal Reserve history been viewed as a sufficient contribution of policy toward expansion during a recession period, when a much higher level of free reserves might have been required to foster desired growth in monetary aggregates (such as bank credit).

An important current issue, however, is whether free reserves have a value even as a gauge of reserve-supply conditions. This has been questioned both inside and outside the Federal Reserve System. To cite a recent article in the Federal Reserve Bank of St. Louis *Review*,

> . . . We [do not] consider free reserves to have any causal impact on bank behavior. The evidence marshalled against free reserves as an important causal link in the monetary process is impressive.[2]

If such views as this are correct, then free reserves are not a good measure of supply conditions in the money market and their usefulness in monetary policy formulation may be seriously questioned.

This article presents the results of a statistical analysis of the impact of free reserves on the growth of bank credit. The conclusions are that free reserves are a significant factor in explaining changes in member bank loans and investments when they are placed into a proper framework which includes the strength of credit demands. Critics who have obtained contrary statistical results have not explicitly recognized the demand side of the monetary process in their analyses.

Outline of Monetary Policy Operations

To place the free reserves controversy into context, we must begin with an overall view of monetary policy operations. The Federal Reserve has three traditional tools of monetary policy, namely, open market operations, the discount rate, and reserve requirements. In addition, it has in recent years used its authority to set maximum rates on savings and other time deposits as a tool to affect the ability of banks to secure funds. The chief tool and only one used daily is open market operations. In these operations, the Federal Reserve buys Government securities when it wants to expand the supply and availability of money and credit and sells when it wants to diminish such supply and availability. These sales and purchases are made to influence the monetary environment of the economy in such a way as to achieve certain desirable results with respect to prices, employment and growth.

In actual day-to-day operations, however, it is obviously impossible to determine or judge the correct magnitude of sales or purchases of Government securities by observing the impact on these ultimate goals of prices, employment and growth. This impact is so long delayed — estimates of relevant lags generally range from 6 months to several years — that it is simply of no help whatsoever as to what sale/purchase action should be undertaken on any given day.

In this situation, as a substitute for its long-term goals, the Federal Reserve has chosen *intermediate* goals which it wants to achieve. These intermediate goals are usually growth rates for monetary magnitudes like bank credit or the money stock. To serve their function well, these intermediate goals should meet two requirements: 1) they should have a predictable effect on the economy with respect to the ultimate goals of prices, employment and growth and 2) they should respond within a reasonable time to Federal Reserve purchases and sales of Government securities. Both these requirements have proven difficult to meet satisfactorily.

The money supply has traditionally been the intermediate goal of monetary policy. However, the experience of the Great Depression after the

[2]Michael W. Keran and Christopher T. Babb, "An Explanation of Federal Reserve Actions (1933-1968)," Federal Reserve Bank of St. Louis *Review*, July 1969, p. 9.

Banking Holiday of 1933 when the money supply rose fairly rapidly but economic activity expanded very slowly cast much doubt on the ability of money to influence prices, growth, and employment. Until well after World War II money remained out of favor as a goal and monetary policy in general tended to be ignored as an influence on the economy. Fiscal policy was believed to be much more potent. Nevertheless, when inflation became a problem during the 1950's the role assigned monetary policy again gained attention and importance. But how to make it most effective has continued to be disputed.

Intermediate goals of policy which have been suggested in the more recent postwar period include interest rates and bank credit as well as the money stock. All of these indicators have the major shortcoming that none has a proven relationship to movements or trends in total economic activity. Interest rates have fared particularly poorly in empirical analyses; for example, surveys of changes in business investment in 1966 as a result of the (then) very high interest rates showed that the impact was quite small.[3]

Bank credit and the money stock have had a somewhat better relationship with economic activity. Research carried out at the Federal Reserve Bank of St. Louis[4] showed the closest association between these variables and GNP.

Analysts generally have not fully accepted these St. Louis results, however. They have questions regarding the chain of causation from money to GNP, the lack of proportionality between the growth rates of these magnitudes and GNP — the money stock since World War II has risen much more slowly than has GNP, a sharp turnabout from the relation of the previous 70 years — and whether these magnitudes would have the same relation to GNP if they were controlled within narrow limits rather than allowed to vary rather freely as they have been in the past.

Nevertheless, while the relationship between intermediate monetary goals and ultimate economic goals has not been perfect, yet it has been good enough to warrant their continued use. In any case, there probably is no alternative but to observe relevant intermediate variables and to rely on subjective judgment at those times when these various measures do not agree reasonably well in their movements.

Short-run Associations Between Policy and Indicators

The second requirement for a well-functioning intermediate indicator is to respond predictably to Federal Reserve policy actions, particularly to sales and purchases of Government securities. Put the other way, the day-to-day operating aim of the Open Market Desk which does the selling and buying of Government securities is to conduct affairs in such a way that the chosen indicators of policy behave as desired. Since numerous factors in addition to open market operations interact to determine the magnitude and use of bank reserves, open market operations cannot directly determine movements in the level of intermediate variables such as bank credit and money supply. Although the Federal Reserve generally attempts to offset reserve changes caused by nonmanaged factors, the willingness of banks to expand credit and of bank customers to borrow also influences movements in the intermediate targets. Open market operations are intended to *induce* banks and the public to be-

[3]Crockett, Jean, Friend, Irwin, and Shavell, Henry, "The Impact of Monetary Stringency on Business Investment," *Survey of Current Business*, August 1967, p. 10 ff.

[4]Andersen, L. C., and Jordan, J. L., "Monetary and Fiscal Actions: A Test of the Relative Importance in Economic Stabilization," *Review*, Federal Reserve Bank of St. Louis, November 1968, pp. 11-21. Only the regressions between the money stock and GNP are shown but unpublished results using bank credit had an even higher R^2 than the .60 or so obtained for using the money stock as the main explanatory variable.

have in certain ways, but they cannot *force* any specific behavior, at least in the short run.

Many slippages can occur between open market sales and purchases and the behavior of banks and the public because the chain of causation is so long as the following listing shows:

1. Open market sales and purchases by the Desk determine the security holdings in the Federal Reserve portfolio.
2. These securities, plus member bank borrowings, float, gold stock, Treasury currency, and some other minor items govern the amount of total reserves supplied to commercial banks. Only about two-thirds of total reserves supplied are provided by open market operations.
3. Of total reserves supplied, more than half is absorbed by currency in circulation, and a small additional amount is absorbed by minor factors leaving only about a third available for member bank reserves.
4. Member bank reserves can be split into three parts according to use: 1) to support demand deposits, 2) to support time deposits, and 3) unused or excess.

This listing shows that the connection between open market operations and a monetary indicator such as bank credit is very loose. It is not surprising that there is almost no correlation between day-to-day or week-to-week changes in open market operations and bank credit.[5]

While open market operations exert little precise control on total bank credit in the short run, these operations can be used to control total member bank reserves within fairly narrow limits. This control is accomplished by offsetting variations in "external" factors like currency in circulation which affect reserves. If, for example, some external factor increases reserves above the current goal level, the Desk can immediately sell securities and reduce reserves back to the goal level.

Although total reserves are controllable within fairly narrow limits even on a daily basis, there is still substantial slippage between them and commercial bank credit or the money supply. This is shown in Chart 1 where these series are plotted on a weekly basis for 1969, together with the bank credit proxy which equals total member bank deposits less interbank deposits and cash items in process of collection. It is quite apparent that movements in the money stock and bank credit do not follow movements in reserves at all closely on a weekly or even monthly basis. In almost every case, the largest movements in total reserves are not paralleled by similar movements in the other series.

Free Reserves Target

In view of the, at best, loose connection in the short run between open market transactions and indicators of policy, the Federal Reserve System has considerable latitude for the day-to-day conduct of these transactions. Under these circumstances, it has developed what has been termed a "money market strategy" in which it instructs the manager of the Open Market Account to maintain a certain degree of ease or firmness in the money market. The level of free reserves is an important measure of this degree of ease or firmness but in recent years it has no longer been considered the sole measure as before. Short-term interest rates, particularly those on Federal Funds and Treasury bills, have been increasingly used together with the level of free reserves to measure money market conditions.

Even though free reserves do not occupy their former unique position as a measure, they nevertheless still reflect quite accurately the desired

[5]See, for example, Sherman J. Maisel, "Controlling Monetary Aggregates," in *Controlling Monetary Aggregates*, proceedings of a Monetary Conference held in June 1969 (Boston: Federal Reserve Bank of Boston, October 1969).

money market stance of the Open Market Committee.[6] Therefore, in this article, the level of free reserves can be viewed as a representation of this money market strategy. Beyond their value as a measure of policy intent, the level of free (or net borrowed) reserves is an indicator of conditions in the credit markets, particularly the ability and willingness of banks to extend loans. While free reserves are equal to excess reserves less member bank discounting from the Federal Reserve Banks, the fluctuation in their level is accounted for mainly by discounting since excess reserves have tended to remain rather stable cyclically though having a declining trend. Thus cyclical changes in the level of free reserves essentially reflect changes in the level of discounting.

When discounting is at a low level, banks are being supplied their required reserves by the open market operations of the Desk. In addition, they usually are able to acquire Treasury Bills and other securities which can be liquidated later if necessary to meet loan demand. But when banks are discounting heavily, their reserve needs are not being met by open market operations and they may not have salable assets which can be liquidated in order to obtain lendable funds. Banks are expected to use other methods of meeting customers' credit needs and their own reserve needs and to turn to discounting only as the last resort.

Discounting places banks under constraint. First, they are expected to repay their borrowing within a short period so they must manage their operations in order to obtain alternative funds or else reduce their requirements by reducing deposits. Second, discounting brings on the "surveillance" of the Federal Reserve Bank which involves a review of the bank's reserve management. Banks find this "looking over the shoulder" uncomfortable and embarrassing to some extent so they strive to limit their discounting as much as possible. Thus the level of discounting, and of free reserves, is a direct indication of the reserve situation and lending stance of member banks.

The monetary inducement or pressure strategy entailed in a free reserves target implies that reserves should act as a short-term shock-absorber for temporary fluctuations in demands for reserves. Thus as demands for bank credit fluctuate around a growth trend; operations with a free reserves target accommodate such fluctuations since reserves supplied will follow variations in demands for reserves. By contrast, operations with some fixed quantity target like total reserves would not allow such variations around the allowed growth trend, consequently the reserve supply would be deficient one period and "excessive" the next. Not only would such a rigid reserve supply course cause wide fluctuations in short-term money market interest rates, but it would also frustrate some borrowers who were trying to secure financing when the quota was being absorbed by others. Even though these disappointed borrowers would be accommodated in the following period, they would have been penalized for no good purpose. Assuming the same total volume of financing under alternative targets, the use of the free reserves target would seem to improve efficiency by causing no "unnecessary" disruption.

Criticisms of the Free Reserves Target

The money market strategy in general as well as the free reserves target has been criticized on two main grounds. The first is that concentration on smoothing hourly and daily fluctuations in the money market is believed to divert attention from the longer-run goal of providing a favorable monetary environment for the economy.

[6]See Keran and Babb, *op. cit.*, pp. 8-9. The authors present an index which measures the policy stance called for in the directives of the Federal Open Market Committee. This index correlates highly with movements in the actual level of free reserves.

While it is conceivable that anxiety over these hourly or daily fluctuations could overshadow concern with broader problems, it is unlikely in actual practice. The main reason is that the policy makers in the Federal Open Market Committee pay little attention to the smoothing operations of the Open Market Desk. A rather clearcut division of function has developed between the Committee and the Open Market Desk. Typically, the Committee votes on a directive specifying the degree of inducement or pressure which should be applied,[7] and then the Desk conducts its smoothing, or defensive, operations around, or centering on, the target levels of free reserves and other measures implied in this directive. It is immaterial for the smoothing operations whether the free reserves target is, say, zero or minus $200 million of free reserves. In fact, since defensive activities typically require more sale or purchase activity than does implementation of policy such as reducing free reserves from zero to minus $200 million, policy implementation is carried out easily and conveniently within the general context of smoothing.

Another criticism of the free reserves target is its ineffectiveness in changing the economic climate. That is, variations in free reserves do not cause corresponding changes in such policy indicators as bank credit or the money supply. The explanation for this presumed ineffectiveness stems from the idea that banks wish to hold a certain level of free reserves and that this desired level of free reserves moves in the same direction as the actual level of free reserves, possibly nullifying the expansionary or constrictive impact of changes in the actual level of free reserves.

The reasoning behind the perverse impact of changes in desired free reserves hinges on possible reactions of banks to variations in interest and discount rates. When money market interest rates rise relative to the discount rate, as usually occurs during business expansions, banks become less reluctant to borrow. Consequently, borrowings will rise, reducing the level of free reserves unless offsetting action is taken by the Federal Reserve. Since banks have chosen to go deeper into debt, we can say that the desired level of free reserves has declined. If the Federal Reserve is aiming at a lower level of free reserves at the same time, the actual level will decline right along with the banks' desired level and the Federal Reserve could mistakenly interpret its action as being contractionary.

According to this line of reasoning, the crucial determinant of monetary and bank credit expansion is the differential between actual and desired free reserves. If actual free reserves exceed the desired, bank efforts to reduce free reserves will result in credit and deposit growth. However, if actual free reserves are less than desired reserves, banks will restrain credit, as they attempt to equate the two. Under any circumstances, according to critics of the free reserve concept, monetary policies must make allowance for shifts in desired free reserves if effective control over the growth of bank credit and the money supply is to be maintained.

Testing the Free Reserves Target

Whether free reserves are an effective short-run target can be tested statistically. One possibility is to correlate the level of free reserves with changes in bank loans and investments. (Bank credit, rather than the money supply, has been selected as the dependent variable because the minutes of the Federal Open Market Committee imply that the Committee, at least over most of the period since the 1950's, has shown greater concern over movements in bank credit than in the money supply. Changes in the money supply are always reported and considered at these

[7] In recent years a "proviso" clause has usually been added which instructs the desk to vary the degree of restraint if results, generally as measured by the bank credit proxy, appear to be deviating significantly from projections.

meetings, but they do not appear to have often formed the basis for policy prescriptions.) However, in this test, the free reserves target fares rather poorly; it explains or determines only about a tenth of the changes in bank loans and investments.[8] This result can hardly be considered satisfactory and appears to support the criticisms of the free reserves target.

Another test correlating free reserves with the Treasury bill rate indicates that the two variables are quite closely related. This suggests that the level of free reserves banks are willing to hold may fluctuate with rates on earning assets and that the levels of free reserves observed may largely be determined by adjustments of banks to bring the free reserve portion of their portfolio to the desired level.[9]

These tests, however, ignore the strength of demand for bank credit. Since free reserves are used as a measure of inducement or pressure, they must be seen as working with, or against, a certain strength of demand for credit. When demands are weak, a given level of free reserves will naturally induce less credit growth than when demands are strong. If this were not the case, the Federal Reserve could fix free reserves at the level allowing the desired rate of growth in bank credit and then leave them unchanged indefinitely, assuming it wanted constant growth in credit.

Therefore, if statistical analysis is used to evaluate the impact of free reserves on changes in some intermediate indicator, a measure of the strength of demand must be included in the analysis. In this study the variable which has been chosen to represent the strength of demands for bank credit is the volume of external funds obtained by all nonfinancial corporations.[10]

Results of the Tests

The test results are described in detail in the Technical Note on page 15 and can briefly be summarized here. First, when the credit demands variable is included in a regression equation with free reserves, both are highly significant as explanatory variables in determining changes in member bank loans and investments (statistical results are shown in Table 1 on page 15). Thus there can be little question that the level of free reserves does have a strong influence on growth in bank credit. The test results also show that this influence cannot be accurately measured alone, but must be analyzed in the proper context; in particular, the strength of credit demands must be taken into account.

The statistical results indicate that a certain rise in the average quarterly level of free reserves is associated with a quarterly rise of almost four times as much in member bank credit, assuming the strength of credit demands remains unchanged. In like manner, a quarterly rise of a given volume in total external credit obtained by nonfinancial corporations is associated with a bank credit rise of one-fourth as much, assuming the level of free reserves remains unchanged.

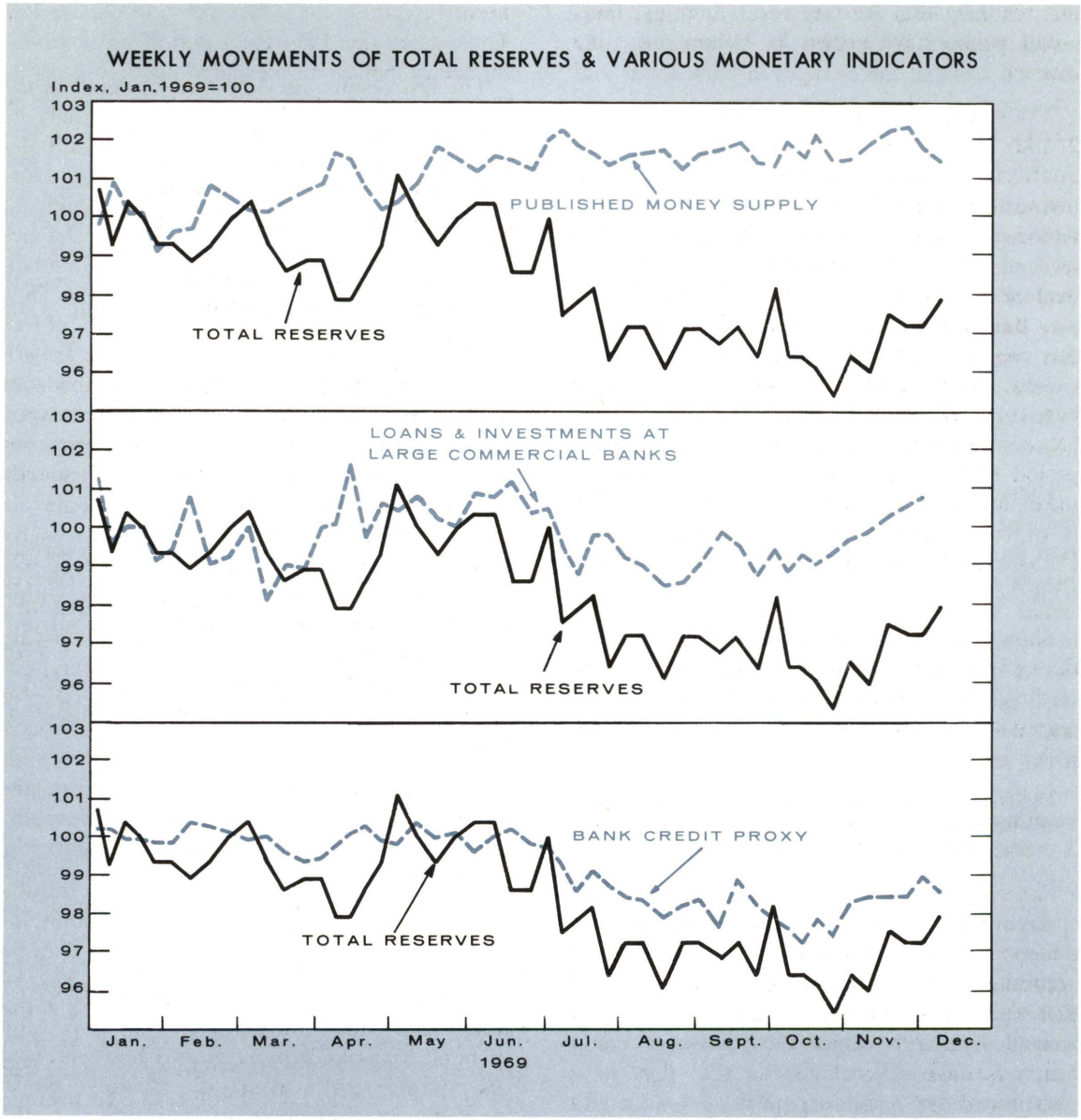
In a real-world situation, both these factors would be operating, of course, and the results would reflect the net impact of their joint influence. For example, credit demands may be tending to raise member bank credit by, say, $4 billion per quarter at the same time that the Federal Reserve System is attempting to slow down the growth of bank credit by reducing free reserves to a minus $300 million. The average net result expected from this combination would be growth of not quite $3 billion in member bank

[8]See, for example, A. James Meigs, *Free Reserves and the Money Supply* (Chicago, 1962), and Karl Brunner and Allan H. Meltzer, *An Alternative Approach to the Monetary Mechanism*, Subcommittee on Domestic Finance, Committee on Banking and Currency, House of Representatives (Washington: U. S. Government Printing Office, 1964).

[9]*Ibid.*

[10]For a detailed explanation of this choice as a proxy to represent the strength of demand see page 15.

Chart 1



Note — All series shown are based on data used prior to revisions caused by redefinition of Euro-dollar checks as deposits subject to reserves.

credit. A casual observer might wonder why bank credit grew at all with such a tighter policy, not realizing that without the tightening, bank credit would have grown $1 billion more per quarter.

The statistical results are illustrated in Charts 2 and 3. Shown in Chart 2 are the actual quarterly changes in member bank loans and investments since 1954 and the changes which would be predicted from the joint impact of the level of free reserves and the strength of credit demands. Actual growth in bank credit fluctuates tremendously from quarter to quarter, yet the predicted changes correspond surprisingly closely. The period 1954-1966 was used as the base for deriving the predicting equation but it has continued to perform about as well in the period since, thus supporting the reliability of the equation. The predictive accuracy since 1966 is especially notable in view of the extreme changes that have taken place in policy and banking operations.

Shown in Chart 3 are the estimated contributions of free reserves and credit demands to bank credit growth. These estimations are based on regression equation (1) in the Technical Note which is,

> Quarterly Growth in Member Bank Loans and Investments = 3.68 Level of Free Reserves + 0.23 Quarterly Credit Demands + Seasonal Factors.

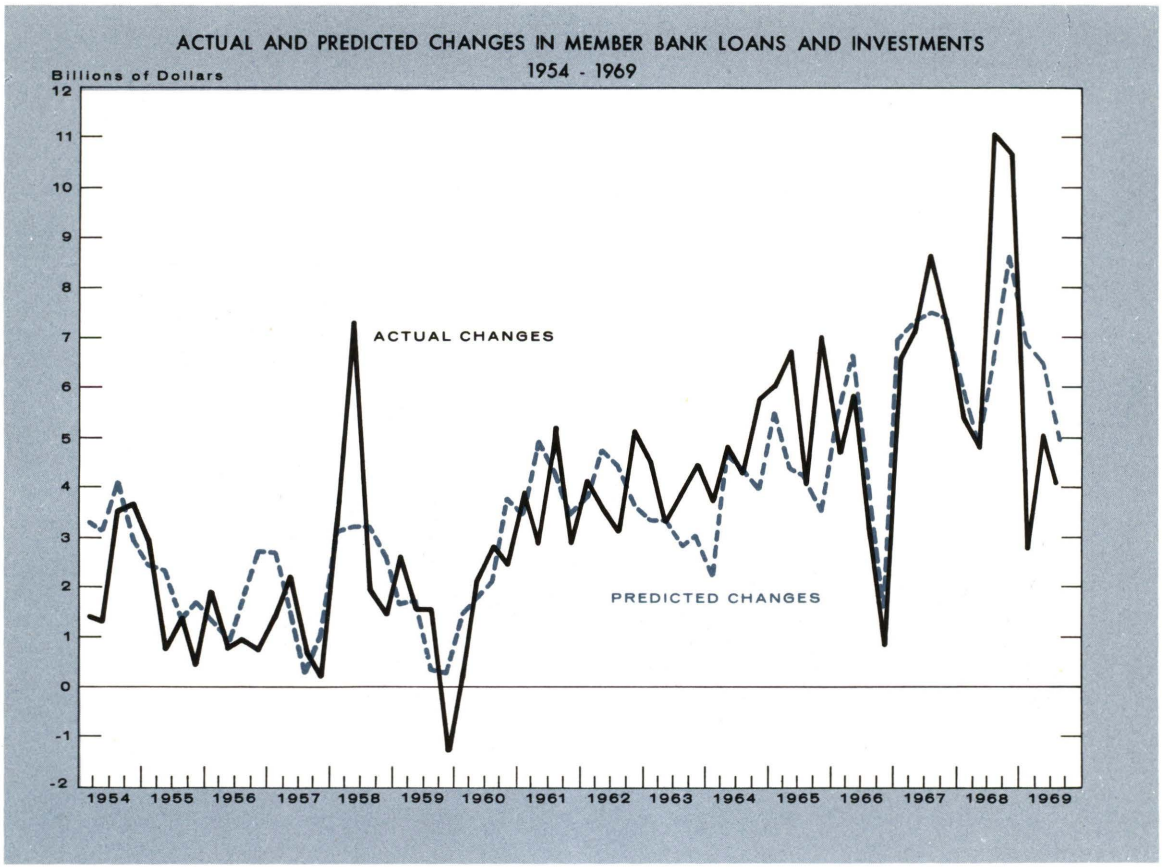
According to Chart 3, credit demands were quite stable from 1954 to 1964, and their impact accounted for member bank credit growth of $2-$3 billion per quarter, or an annual rate of around 5 percent. Since 1964, however, credit demands have skyrocketed so that they have contributed $5-$7 billion a quarter to bank credit growth, or an annual rate approaching 10 percent.

The contribution of free reserves to growth in member bank loans and investments averaged out to about zero from 1954 to 1960, being positive in the recession years of 1954 and 1958 and negative during the other years of the period. Thus, over the 1954-1960 period as a whole, monetary policy as measured by free reserves was a stabilizing influence on credit growth although criticism has been directed at certain episodes, particularly the excessive ease in 1954, the late move toward ease in 1957, and the excessive tightness in 1959. The net result in terms of credit growth over this period probably can be considered satisfactory, however, since growth averaged close to the noninflationary rate of 4-5 percent annually.

From 1960 to 1964, free reserves were adding substantially to credit growth at a time when credit demand contribution alone was achieving a 4-5 percent growth rate. This added growth, however, seemed necessary to stimulate an underemployed economy. After 1964 free reserves did turn negative but the restraint was wholly inadequate to keep credit growth within noninflationary bounds. The positive contribution of free reserves to credit growth in 1967 seems especially inappropriate in light of the tremendous strength of credit demands that year.

Since the statistical analysis supports the effectiveness of free reserve levels in influencing extensions of bank credit, it likewise supports the reluctance theory of discounting. The coefficient for free reserves is positive and highly significant in all regressions, indicating that reserve additions obtained through Federal Reserve Open Market operations or reductions in reserve requirements, other things equal, lead to expansion of bank loans and investments while increased discounting results in credit restraint. Banks evidently are reluctant to borrow from the Federal Reserve and experience pressure to repay quickly. For rising levels of discounting to facilitate credit expansion, the coefficient of free reserves should be negative.

Chart 2



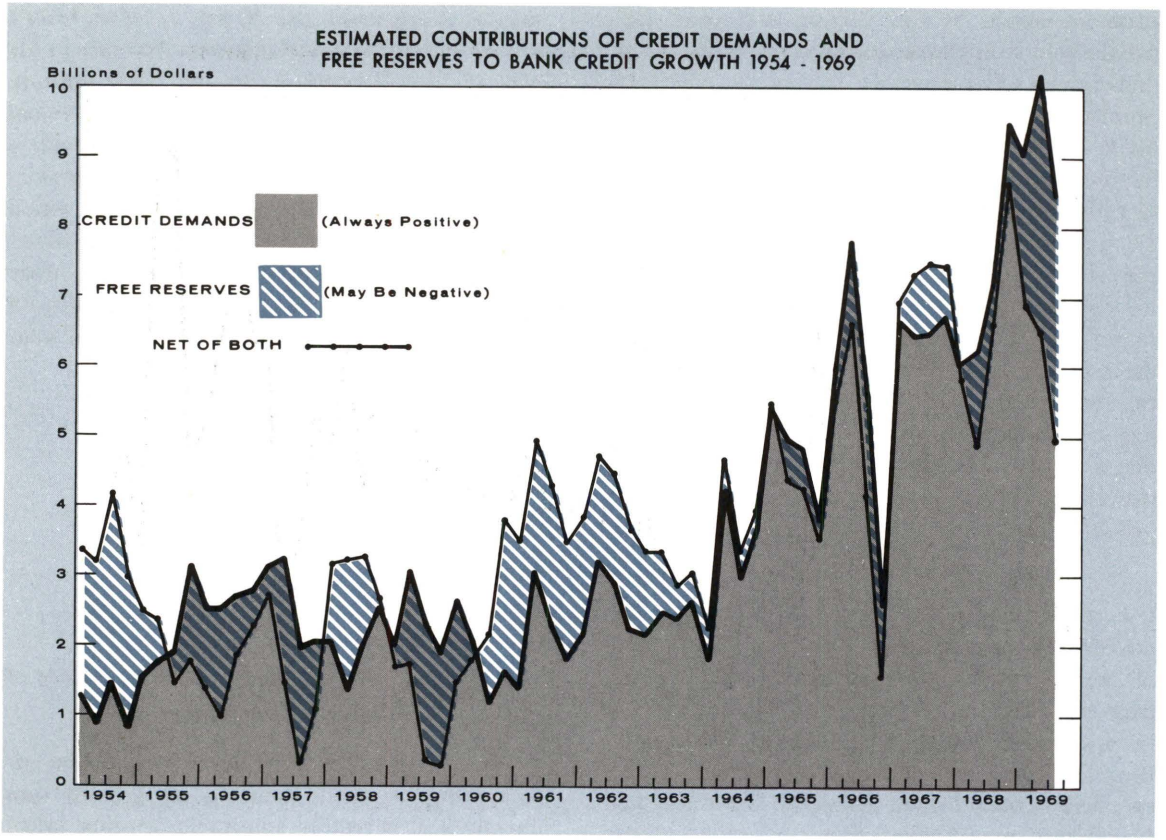
Test Results for Other Variables

When interest rate variables, like changes in bill rates or in the difference between the bill rate and the discount rate, are added to regression equations containing free reserves and credit demands, they add almost nothing to the explanatory power of the equations. Furthermore their coefficients are negative, and significantly so in the case of the bill rate. Admittedly, the difference between the bill rate and the discount rate was generally not large during the period analyzed and it is possible that bigger differences would have yielded different results.

Nevertheless, the results suggest that the significance of short-term interest and discount rates in affecting bank behavior has been greatly overemphasized and that as long as the Fed keeps the differential between the two rates relatively small, it need not worry about changes in the desired level of free reserves due to this factor. The demand for bank loans clearly seems to be a more important determinant of growth in bank credit than are interest rate differentials.

The final group of statistical tests involved a comparison of the impact of alternative policy targets, namely, nonborrowed reserves, total reserves, and the monetary base, which is total re-

Chart 3



Explanatory Note — The chart is based on Equation (1) in the Technical Note. The free reserves effect equals 3.68 times their average quarterly level, while the credit demands effect equals 0.23 times total net external funds obtained by non-financial corporations. When free reserves are positive, their effect is added to the credit demands effect, but when they are negative (net borrowed), their effect is subtracted.

serves plus currency outside banks. These alternative targets do not generally test much better than do free reserves despite the fact that they have a direct relation to member bank credit. This direct relation arises from the fact that required reserves are determined by member bank deposits and the latter are directly related through the balance sheet to member bank loans and investments.

Some Implications for Policy

The main conclusion of this article is that free reserve levels do have a significant impact on growth in bank credit. But even if this were granted, it must be recognized that major problems remain in policy formulation. Free reserves operate only on the supply side of the supply-demand interaction that determines the level of monetary aggregates like bank credit and the money supply. The level of free reserves can be fixed within a rather narrow range, but demands for credit vary widely and subsequently wide fluctuations occur in the growth of bank credit even with a given level of free reserves.

Assuming that an intermediate objective like growth in bank credit or money were adopted

by the Open Market Committee, its primary problem would be the varying and often unpredictable strength of demands for bank credit and money. For example, suppose at a certain point in time, the desired annual growth rate of bank credit, say 4 percent, had been satisfactorily achieved for several months with a target level of minus $100 million of free reserves. Then, if in a subsequent month bank credit begins rising at an 8 percent annual rate, a decision has to be made whether to continue the previous target level of free reserves. The difficulty is that the 8 percent growth may be a random fluctuation which would be offset by zero growth in the following month or it may reflect a stronger demand for bank credit than had been anticipated which would result in another month of 8 percent growth if no changes in policy were made.

The basic problem here then is judging the true underlying strength of demand for bank credit from monthly observations of actual rates of credit growth. One approach would be to treat the situation as a quality control problem in production where no action is taken until there is a certain "run" of observations outside specified control limits. Thus the Open Market Committee might take corrective action when actual monetary growth deviates from the desired trend by a certain amount. Such an approach could evolve into a relatively mechanical and routine operating procedure once some growth rate for a monetary magnitude were adopted.

The choice of definite limits for growth of a intermediate goal like bank credit or the money supply would probably be a much more important decision than the mode of day-to-day operations. If such an intermediate goal were followed with determination, wider month-to-month swings in money market conditions would occur than under the money market strategy which is followed with a relatively fixed free reserve target. For example, to correct for higher-than-anticipated demands for bank credit which resulted in a growth rate of, say, 8, rather than a desired 4, percent would require a decrease in the level of free reserves of around $800 million. (According to Equation (1) in the Technical Note each change in the level of free reserves of $100 million implies a corresponding quarterly change in bank credit of $368 million which represents an annual rate of change of about one-half of one percent.) Thus much more vigorous monetary policy changes would be necessary under a definite growth rate goal than have occurred in the past.

Financial observors have often set up the free reserves target and intermediate goals such as a certain growth rate of monetary magnitudes as opposing modes of policy formulation. But as we have seen, there need be no conflict since the free reserves target can be a useful tool in reaching a growth rate objective. Nevertheless, free reserves are not an absolute necessity in the context of Open Market operations. A variety of short-term target variables are feasible.

While the free reserves target is useful in implementing a policy focusing on growth rate objectives, it is readily adaptable to other intermediate goals as well. Not all policy formulators and advisors accept monetary and credit growth rates as sole, or even primary, intermediate objectives; it still remains to be proven that monetary policy acts only through specific monetary quantities or aggregates. It is possible, for example, that general conditions in the money and credit markets affect anticipations and business planning quite apart from developments within monetary aggregates. The free reserves target is well suited to accommodate such policy assumptions since it both measures sensitively credit availability and quite accurately reflects movements in the cost of credit.

A fact which tends to be overlooked in disputes over the free reserves target is that the

magnitude called free reserves, whether used as a target or entirely ignored, occupies a central place in the chain of operations involved in monetary policy. Insofar as monetary policy entails action to influence the size of financial quantities such as member bank reserves, bank loans and investments, and the money supply or total credit flows, it must first affect free reserves.

As the System increases (or decreases) total Federal Reserve credit, which is essentially the only quantity action it can take, this immediately and necessarily tends to move free reserves in the same direction. Similarly, if reserve requirements are changed, free reserves are concurrently changed. If the Federal Reserve were to use interest rates as its goal, its operations to influence rates (other than the largely symbolic effect of the discount rate) would again directly affect free reserves. Thus even though free reserves could be totally ignored in carrying out policy, fluctuations in their level would continue as in the past as banks adjusted to Federal Reserve policies and to changes in the demand for credit.

Summary

The use of the level of free reserves as a short-term target for monetary policy operations has been criticized in recent years. The two chief bases of criticism are that the use of such a short-run target diverts attention from the longer-run influence of policy and it is not functional, meaning it does not affect more basic monetary variables in desired ways.

When the free reserves target is considered in its proper context, however, it appears to be a reasonable target for guiding daily and weekly operations. In statistical tests, if the strength of demand for bank credit is included in regression equations, the level of free reserves is a significant variable explaining changes in member bank loans and investments.

TECHNICAL NOTE:
Formal Analytical Model

The model underlying the empirical analysis in this article is an excess demand equation for free reserves. The growth in bank loans and investments is assumed to be functionally related to the difference between the actual level of free reserves and the level desired by the banking system. Consequently:

$$\Delta L + \Delta I = S + X_1 (FR - FR^*)$$

where:

$\Delta L + \Delta I$ = Quarterly Change in Member Bank Loans and Investments

S = Seasonal Variables

FR = Actual Level of Free Reserves

FR^* = Desired Level of Free Reserves

If the actual level of free reserves exceeds the desired, banks will grant loans and purchase securities in an effort to reduce free reserves. Conversely, if the actual level of free reserves is less than the desired, efforts by banks to increase the actual level would result in contraction in loans and investments.

Some observers have concluded that the relatively high correlation between the Treasury bill rate and the level of free reserves indicates that the level of free reserves desired by banks is highly sensitive to interest rates and that the observed level is likely to approximate the desired level. But if monetary policy in conjunction with the demand for credit determines both free reserves and interest rates, a high correlation between free reserves and interest rates could merely mean that policies influence more than one variable, but would imply nothing about the relationship between actual and desired free reserves. In the model presented here, the actual level of free reserves is taken as a marginal measure of Federal Reserve policies.

The level of free (or net borrowed) reserves desired by the banking system is a function of numerous variables, but the most important would appear to be the demand for loans and interest and discount rates. As the demand for loans increases, banks are increasingly willing to risk the possibility of being forced to discount and the desired level of free reserves should decline, producing an increase in bank credit. On the other hand, the higher the level of money market interest rates relative to the discount rate, the greater could be the incentive of banks to secure additional loanable funds by borrowing from the Federal Reserve. A relative rise in the level of money market rates, therefore, may be associated with a decline in the desired level of free reserves and lead to an expansion of bank loans and investments.

A measure of the strength of demand for loans is a crucial variable in this model. Unfortunately, it is difficult to measure demand for bank credit or for any other good because demand is not observed by itself. What can be measured is the amount "sold" and this is the amount demanded at a certain "price." If the price were lower, more would be demanded and vice versa.

The best that can be done in measuring demand for bank credit is to obtain some indicator which tends to vary with the strength of the demand. One possibility is total credit obtained in the Nation from all sources by all borrowers — Federal, State and local governments, business, and consumers, the latter including both consumer credit and mortgage credit. But the difficulty with this measure is that the credit obtained by some of these groups is not closely associated with the demand for bank credit which fluctuates quite closely with the cycle. Credit obtained by the Federal government and mortgage borrowers, for example, tends to be contracyclical, generally reaching highs in the latter half of recessions.

The most pronounced cyclical pattern among these groups is shown by businesses so their total borrowing should serve well as an indicator of variations in bank credit demand over the cycle. Also the demands of large businesses for external funds are quite inelastic so that the total business funds obtained are not usually influenced greatly by variations in interest cost. Furthermore, although business firms typically obtain less than a quarter of their external funds from banks, they own the largest deposits and are the banks' prime customers. Thus banks would be quite anxious to satisfy their demands for credit if at all possible. Despite these favorable factors, the total of external funds obtained by businesses is not, of course, a foolproof measure of the strength of demands for bank credit. It is used here simply as a reasonable indicator and with further study a better measure conceivably could be derived.

Results of the Tests

When total credit obtained by corporate non-financial businesses is inserted into the regression equation with the level of free reserves, results were obtained of which equation (1) in Table 1 is typical. The coefficient of free reserves is highly significant and explained variance, R^2, is up around two-thirds. Thus, when the strength of credit demands as measured by total external funds obtained by businesses is taken into consideration, the tests show that free reserves have a potent impact on changes in bank credit. That is, with a given intensity of demand for bank credit, the actual amount of credit extended by banks is significantly affected by the level of free reserves. These results strongly support the functional usefulness of a free reserves target.

The coefficient of 3.68 for free reserves signifies that member bank loans and investments will rise $300-$400 million

Table 1

REGRESSION EQUATION ESTIMATING QUARTERLY CHANGES IN MEMBER BANK LOANS AND INVESTMENTS

		Coefficients				
Equation	*Free Reserves*	*Credit Demands*	*Change in Treasury Bill Rate*	*Treasury Bill Rate Minus Discount Rate*	R^2	*Durbin-Watson Statistic*
(1)	3.68 (5.9)	0.23 (6.0)			.67	1.91
(2)	3.27 (5.1)	0.25 (6.5)	−0.81 (2.0)		.70	1.92
(3)	3.15 (4.2)	0.25 (6.2)		−0.96 (1.3)	.69	1.93

NOTE: Quarterly seasonal variables are not shown above; t-values are in parentheses.

per quarter for each additional $100 million in the level of free reserves, assuming no change in the demand for credit. Similarly, the coefficient of 0.23 for credit demands means that, assuming no change in free reserves, on the average, bank loans and investments will rise about one-fourth as much as total credit obtained by businesses.[1]

[1] All regression results reported in this article are based on quarterly data from 1954 through 1966. The coefficients obtained for regressions run for somewhat shorter time periods are about the same, suggesting that the estimated coefficients are relatively stable.

One way of validating a model is to test its performance in predicting future values of the dependent variable. This has been done for 11 quarters following the fourth quarter of 1966. The predictions for the first six quarters are very accurate and the cumulative error in the prediction is less than $140 million. During the third and fourth quarters of 1968, however, the model predicts considerably less growth in bank credit than actually occurred. During this period money market interest rates declined relative to the rates banks were paying on certificates of deposit and the volume of CD's grew very rapidly. In the three quarters of 1969 the accuracy of the predictions again improves, but on balance the model predicts more growth in bank credit during these quarters than actually occurred. This divergence is partially attributable to the large runoff of CD's which banks have experienced.

Despite the errors in some quarters the model performs very well. For the period since 1966 as a whole, the predicted growth in loans and investments differs from the actual growth by less than $60 millions. This accuracy is remarkable in view of the sharp dislocations in credit flows which occurred during these 11 quarters.

Influence of Interest Rates

Other equations in the table show the impact of the Treasury bill rate and the difference between the bill rate and the discount rate. As contrasted with results obtained by critics of the free reserves target, here both have coefficients which are either statistically insignificant or have the wrong sign. As stated earlier, critics said that changes in the bill rate could totally offset the influence of free reserves, so that, for example, rises in the bill rate would lead to increases in bank credit even if free reserves declined to negative levels.[2]

Since the addition of the credit demand measure causes the interest rate variables to become insignificant or negative as contrasted with the critics' regression results, the interest rate in the critics' equations evidently is a proxy for the strength of credit demands. This suggests that the critics' equations are misspecified.

Alternative Policy Targets

Critics of the free reserves target have suggested alternate policy targets which they claim are more effective for monetary stabilization purposes. The most frequently recommended alternatives are nonborrowed reserves, total reserves,

[2] See for example, A. James Meigs, *op. cit.* and Karl Brunner and Allan H. Meltzer, *op. cit.*

Table 2

REGRESSION EQUATIONS FOR ALTERNATIVE POLICY TARGETS TO INFLUENCE QUARTERLY CHANGES IN MEMBER BANK LOANS AND INVESTMENTS 1954-1966

Equation Number	*Explanatory Variables*	*Coefficients & t-values*	R^2
(1)	Free Reserves	3.68 (5.9)	.67
	Credit Demands	0.23 (6.0)	
(4)	Nonborrowed Reserves	4.43 (4.2)	.51
(5)	Nonborrowed Reserves	4.75 (5.2)	.64
	Credit Demands	0.15 (4.0)	
(6)	Nonborrowed Reserves	2.82 (3.0)	.73
	Credit Demands	0.21 (3.5)	
	Free Reserves	2.59 (3.8)	
(7)	Total Reserves	8.73 (7.5)	.69
(8)	Total Reserves	6.33 (5.1)	.79
	Free Reserves	1.70 (2.7)	
	Credit Demands	0.16 (4.7)	
(9)	Monetary Base	5.23 (9.7)	.78
(10)	Monetary Base	4.32 (6.5)	.83
	Free Reserves	1.95 (3.7)	
	Credit Demands	0.04 (0.9)	

and the monetary base. No definitive answer can be given as to the desirability or effectiveness of these alternatives as compared to a free reserves target but statistically and theoretically, free reserves seem to do at least as well as their competitors.

Shown in Table 2 are the comparative statistical results of using free reserves and the other suggested targets. Analysis of these results entails comparison of the resulting R^2, or percentage of variation in loans and investments "explained" by the several equations, and diagnosis of the factors causing a higher R^2 in equations (6) through (10) than in the free reserves equation (1).

The free reserves credit demand equation (1) yields an R^2 of .67, which is higher than that of equation (4) with nonborrowed reserves as the explanatory variable or that of equation (5) where credit demands are joined with nonborrowed reserves. The higher R^2 for equation (1) suggests that free reserves are rather effective in inducing or restraining credit growth as the case may be. Nonborrowed reserves comprise about 97-98 percent of total reserves on average (discounts account for the remaining 2-3 percent). Since total reserves must grow with member bank loans and investments (when adjustments are made for decreases in reserve requirements), there is a built-in, mechanical connection between nonborrowed (as well as total) reserves and bank credit. (In theoretical terms, required reserves make up all but a small fraction of total reserves and are, therefore, very highly correlated with nonborrowed and total reserves. To the extent that the Federal Reserve has followed a money market, or free reserve, strategy, it has supplied reserves as banks expand loans and investments. Thus, the relationship between changes in bank credit and an aggregate reserve is very close.) There is no similar necessary connection between free reserves and bank credit so the R^2 of equation (1) is impressive.

The same observation about a built-in connection can be made concerning equation (7) where total reserves are the explanatory variable. While its R^2 at .69 is a little higher than that of equation (1), the edge is certainly minor and probably is largely due to the built-in factor. As equation (8) shows, the addition of free reserves and credit demands to total reserves improves the R^2 substantially. These equations suggest that if the Federal Reserve were to seek to regulate movements in total reserves, its control over the growth of member bank credit would be about as close as with a free reserve target. However, the extent to which this would result in wider and perhaps potentially disrupting fluctuations in interest rates and other money market conditions cannot be known with certainty.

The remaining equations in Table 2, (9) and (10), have higher R^2 than equation (1). The monetary base of these equations equals total reserves plus currency in the hands of the public. Thus the higher R^2 of equation (9) than of (7) is due to the inclusion of currency. This raises an analytical problem: how does currency in the hands of the public affect member bank loans and investments?

The Federal Reserve accommodates the public's demand for currency and the net impact of an increased demand is a rise in its holdings of Government securities. Usually the increased currency is obtained initially from commercial banks by a liquidation of a demand deposit. The banks in turn replenish their vault cash by selling Government securities to the Federal Reserve. The Federal Reserve may then provide enough additional reserves to enable commercial banks to restore the decline in the level of bank credit caused by the sale of securities to replenish vault cash.

It is difficult to understand why such a rise in currency holdings should lead to an increase in bank credit, but that is what the higher R^2 for equations (9) and (10) than for equation (1) seem to indicate. The most likely explanation is that changes in currency holdings for some reason reflect changes in general demands for credit. This is supported by a comparison of equations (8) and (10). The monetary base in (10) differs from total reserves in (8) essentially by the amount of currency holdings of the public but when it is substituted for total reserves in the equation, the chief result is that the coefficient of credit demands is cut to one-fourth its previous magnitude and becomes statistically insignificant.

Whether currency in the monetary base is meaningful or not seems, however, to be irrelevant so far as its serving as a monetary policy target. A variable used to carry out policy should be directly influenced by open market sales and purchases. Currency in the hands of the public is not such a variable. The public controls the amount of currency it wants to hold and open market operations have no discernible impact on this decision. To this extent the monetary base seems not to be a good operational policy target.

Remarks by NORMAN S. FIELEKE, *Asst. Vice President and Economist of the Federal Reserve Bank of Boston, at Area Bank Conferences in September 1969.**

The U.S. Balance-of-Payments Deficit and the State of International Reserves

FOR a number of years the world has had to wrestle with two closely related problems in the field of international finance, namely, the U. S. balance-of-payments deficit and the state of international reserves. These remarks briefly discuss a few salient aspects of these two problems and suggest the nature of the relationship between the problems.

The U. S. Balance-of-Payments Deficit

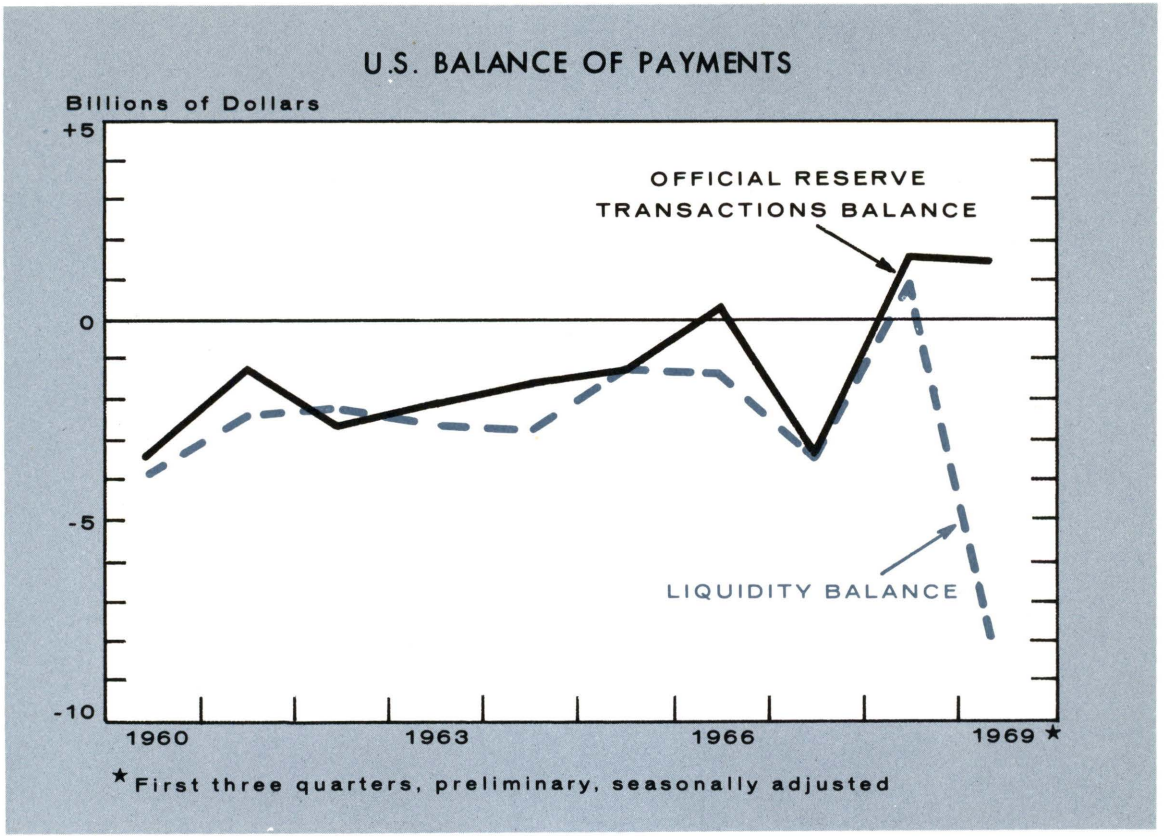
To start with the U. S. balance of payments, it continues to be a matter for concern, although some of the data are rather confusing. Indeed, as shown by Chart 1, one measure of the balance indicates that the United States enjoyed a substantial surplus during the first three quarters of 1969, while another measure indicates an awesome deficit. Specifically, the official reserve transactions measure recorded a surplus of $1.5 billion, while the liquidity measure recorded a deficit of $7.9 billion.

In order to make a judgment about the balance-of-payments situation, one must know what accounts for the difference between these two measures. The difference is accounted for largely by Euro-dollar borrowings, or, more generally, by flows of private short-term foreign capital into the United States. Short-term private loans by foreigners to U. S. residents are not counted as balance-of-payments receipts in computing the liquidity balance, but these loans are counted as receipts in computing the official reserve transactions balance. Since there has been a large volume of such loans in the recent past, the two measures of the balance of payments have diverged widely.

In our opinion, the official reserve transactions measure is generally the better indicator of the U. S. balance-of-payments position at any par-

*Slightly revised for presentation in this format.

Chart 1



ticular point in time. After all, to take the recent experience, if the U. S. position during the first three quarters of 1969 had been as bad as the liquidity measure suggests, there should have been much concern over the strength of the dollar internationally, and a flight from the dollar might have developed. Instead, there have not even been rumors of such a flight, and the dollar has been a strong currency. On the other hand, in respect to the future, lending by foreigners to U. S. residents appears to be diminishing, and past foreign loans may be repaid rather than renewed. Therefore, the official reserve transactions measure will probably move into deficit unless some random occurrence, such as further Soviet aggression in Europe, drives foreign capital into this country again.

In any event, the U. S. balance of payments has been a matter of concern for some time. One aspect of the problem has been the deterioration in the U. S. balance of trade, a matter which is considered briefly in the following section.

The Disappearance of the U. S. Trade Surplus

Since 1964 the U. S. trade surplus has dwindled away. Exports and imports are now running almost neck and neck, and if one were to deduct from the export total those exports financed by

CONSUMER AND WHOLESALE PRICE INDEXES FOR SELECTED COUNTRIES
1963 — June, 1969

Year	*Consumer Price Index*						*Wholesale Price Index*					
	United States	*Canada*	*United Kingdom*	*France*	*West Germany*	*Japan*	*United States*	*Canada*	*United Kingdom*[1]	*France*	*West Germany*	*Japan*
1963	100	100	100	100	100	100	100	100	100	100	100	100
1964	101	102	103	103	102	104	100	100	104	102	101	100
1965	103	104	108	106	106	111	102	102	105	103	104	101
1966	106	108	113	109	110	116	106	106	108	105	105	103
1967	109	112	115	112	111	121	106	108	108	105	104	105
1968	114	117	121	117	113	128	109	110	117	106	99	106
June, 1969	120	122	128	124	116	133	113	116	121	113	100	108

[1]Index for basic materials.

foreign aid, he would discover a commercial trade deficit. Such a reduction in a country's trade surplus (or an increase in its trade deficit) suggests that the country's competitive position in world markets has weakened.

Further evidence that the U. S. competitive position in world markets has weakened is offered by the behavior of the U. S. share of total merchandise exports of non-Communist countries. Between 1964 and 1968 this U. S. share declined slightly, from about 17.5 percent to about 16.3 percent. If U. S. merchandise exports are compared with those of just the *industrial* non-Communist countries, there appears to be a somewhat sharper deterioration, as the U. S. share of these exports has fallen from 24.7 percent in 1964 to 22.2 percent in 1968. Data for the first half of 1969 do not alter the general picture.

Why has the United States experienced this deterioration in its competitive position in world markets? One possible answer is that the rate of inflation has been higher here than in other countries. However, this answer is not altogether correct, as the accompanying table reveals.

These data on price trends suggest that since 1963 the United States has not experienced more inflation than the typical major advanced country.[1] The U. S. comparative performance

[1]It is difficult to select the proper measures of price change to use in comparing rates of inflation between countries and in estimating the extent to which exchange rates between national currencies depart from their equilibrium levels. If a single measure is to be used, an index which gives appreciable weight to non-traded items is in our opinion generally superior to an index which includes virtually nothing but internationally traded items. For an introduction to this subject, see Gottfried Haberler, *A Survey of International Trade Theory* (Princeton, N. J.: Princeton University, 1961), pp. 48-50.

over this period would of course have been even better had not the rate of inflation in this country accelerated after 1967; in the fiscal year ending June 30, 1968, increased Federal defense spending and delay in raising tax rates contributed to a huge Federal budget deficit, with seriously inflationary effects. The lowest rate of inflation among the countries in the table has occurred in West Germany, a fact which helps to explain why that country has run a balance-of-payments surplus in recent years.[2]

It is clear that price indexes do not tell the whole story. For example, Canada and the United Kingdom appear to have experienced more inflation than the United States has since 1963, a development which tended to improve the U. S. balance of trade. But Canada and the United Kingdom, and France as well, have devalued their currencies at one time or another during the past 8 years, and when a country devalues the effect is to make its goods more competitive in world markets.

To be more specific, there were devaluations of 14 percent by the United Kingdom in 1967, 11 percent by France this year, and about 9 percent by Canada when it abandoned its floating rate in 1962. Each of these devaluations, taken by itself, acted to reduce the U. S. trade surplus (although the full effects of the French devaluation are still to be experienced). To be sure, working in the opposite direction were upward currency revaluations of 5 percent by both West Germany and the Netherlands in 1961 and of 9 percent by West Germany again in October of this year. However, not only are these revaluations generally smaller than the devaluations; they also affect a much smaller volume of U. S. trade. The upward valuations directly affect only about 10 percent of U. S. trade, but the devaluations, which made U. S. goods less competitive, directly affect more than a third of U. S. trade.[3]

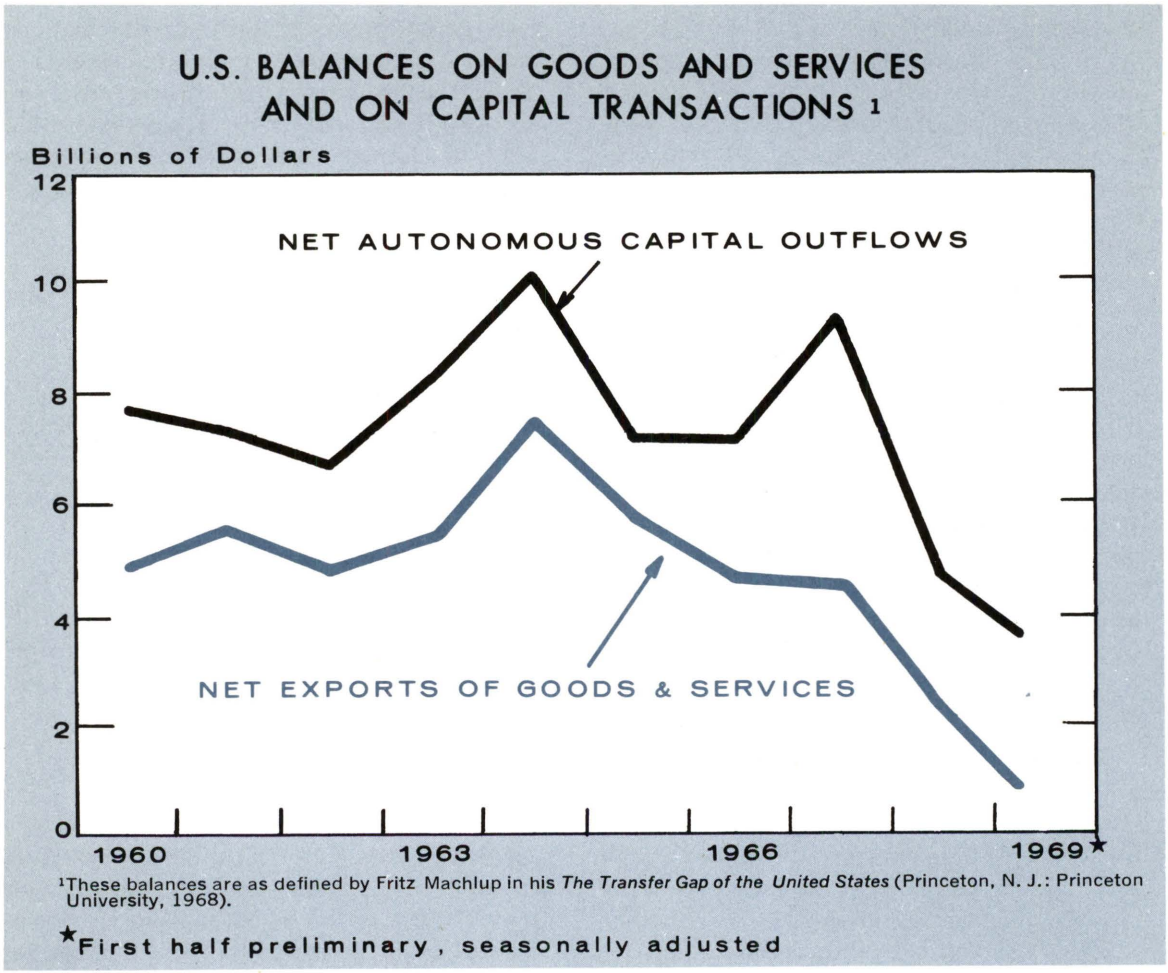
The implication is not that France, Canada, and the United Kingdom devalued in order to impair the trading position of the United States. On the contrary, countries which devalue usually are driven to do so by depletion of the reserves with which they support the exchange value of their currencies. The point is that their devaluations may help to explain why the U. S. trade surplus has contracted even though the U. S. record on inflation seems better than theirs. In this connection, it should be noted that the option to devalue is not nearly so readily available to the United States, because many other countries would be strongly affected; quite a few countries hold a large portion of their international reserves in the form of dollars, a matter which is elaborated below, and carry on a significant share of their trade with the United States.

Another factor which may help to explain the deterioration in the U. S. trade surplus is the automotive agreement which this country concluded with Canada in 1965. This agreement substantially reduced the barriers to trade between the two countries in automotive products. The announced goal was to integrate the automotive industries in the two countries, with each country specializing in the production of those items it could make the more efficiently. While such a goal may seem praiseworthy, the impact on the U. S. surplus in automotive trade with Canada appears to have been adverse, as that

[2]Inflation in Japan has been relatively great in terms of the consumer price index but relatively small in terms of the wholesale price index. Because Japan's trade balance has been in substantial surplus recently, the wholesale price index, which gives more weight to productivity gains in the production of traded goods, may be the better indicator in Japan's case. [Cf. Bela Balassa, "The Purchasing-Power Parity Doctrine: A Reappraisal," *The Journal of Political Economy*, LXXII (December, 1964), 593-95.] On the other hand, the adverse impact on Japan's trade surplus of the sort of inflation suggested by Japan's consumer price index could have been at least partly offset by Japan's intensive use of trade controls.

[3]"U. S. trade" is here defined as U. S. general imports in 1968. A precise analysis of the effects of exchange rate changes would also have to consider price elasticities of supply and demand, among other things.

Chart 2



surplus has declined from about $583 million in 1964 to about $164 million in 1968.[4]

One reason for this result is that part of the agreement serves to restrict the U. S. components which are incorporated into vehicles made in Canada, so that U. S. exports of automotive products to Canada have been restrained. This restriction of U. S. exports under the agreement was intended to be merely a temporary measure to help the Canadian automotive industry adjust to the agreement; and the President has suggested that the time has come to remove the restriction, considering how rapidly the Canadian industry has grown. Of course, even if the restriction on U. S. exports were removed, the agreement would still work to reduce the U. S.

[4]These data exclude tires and tubes. Over the same period, a U. S. surplus of $776 million on all merchandise trade (excluding military) with Canada was converted to a deficit of $453 million, indicating that factors other than the automotive agreement have also contributed to the deterioration in the U. S. trade balance with Canada. These other factors may also have affected trade in automotive products.

trade surplus if Canada turned out to be more efficient than the United States in the production of enough automotive items.

In our view, still another factor which has reduced U. S. net exports is the Federal restraint on U. S. lending and investing abroad. As Chart 2 shows, there is a fairly close correlation between U. S. net exports and the net capital outflows from this country for lending and investing abroad. When U. S. capital outflows decline, net exports usually also decline; and in recent years the sharp reduction in capital outflows caused largely by the Government control programs has been paralleled by a reduction in net exports.

One reason for this relationship between capital outflows and net exports is that foreigners who receive dollars usually spend some of the dollars directly on U. S. goods and services. When their dollar receipts are diminished, their expenditures on U. S. goods tend to decline as well.

In addition, when firms (including banks) are prevented from transferring funds abroad, they tend to spend or lend the money in this country. They are not likely to hold the money in idle balances. The result is a tendency to raise spending and prices in this country, and also to reduce spending and prices abroad below what they would have been if the funds had been transferred. If spending and prices rise more rapidly here and less rapidly abroad, the U. S. trade surplus suffers.

Still another reason for the relationship is that when the transfer of funds abroad is reduced, the balances of payments of foreign countries are weakened, so that the governments of these countries tend to pursue more deflationary policies than they otherwise would follow in an attempt to reverse part of the change in their balances of payments. The result, again, is to diminish U. S. net exports.[5]

There is little debate among economists over these general tendencies, but much debate over their strength and over the importance of other factors. For example, in explaining changes in net exports one finds it difficult to isolate the influence of the capital outflow controls from the influence of other factors tending to increase the rate of inflation in this country relative to the rate of inflation abroad. To take another example, some economists have maintained that U. S. investments abroad go largely into plants whose output competes with U. S. exports. To give some idea of the range of opinion on these matters, Professor Machlup of Princeton has argued that U. S. net capital outflows are usually matched almost dollar for dollar in the same year by net exports of goods and services, while G. C. Hufbauer and F. M. Adler have maintained that U. S. direct investment overseas may act to augment the U. S. balance-of-payments deficit for many years.[6] No attempt is made to settle this controversy in the present brief remarks; here we simply note that our own research, together with that of Rolf Piekarz and Lois Stekler,[7] lead us to a view closer to that of Machlup than to that of Hufbauer and Adler.

Of course, the fact that the U. S. trade surplus has dwindled away does not mean that the surplus cannot be enlarged again. In particular, if

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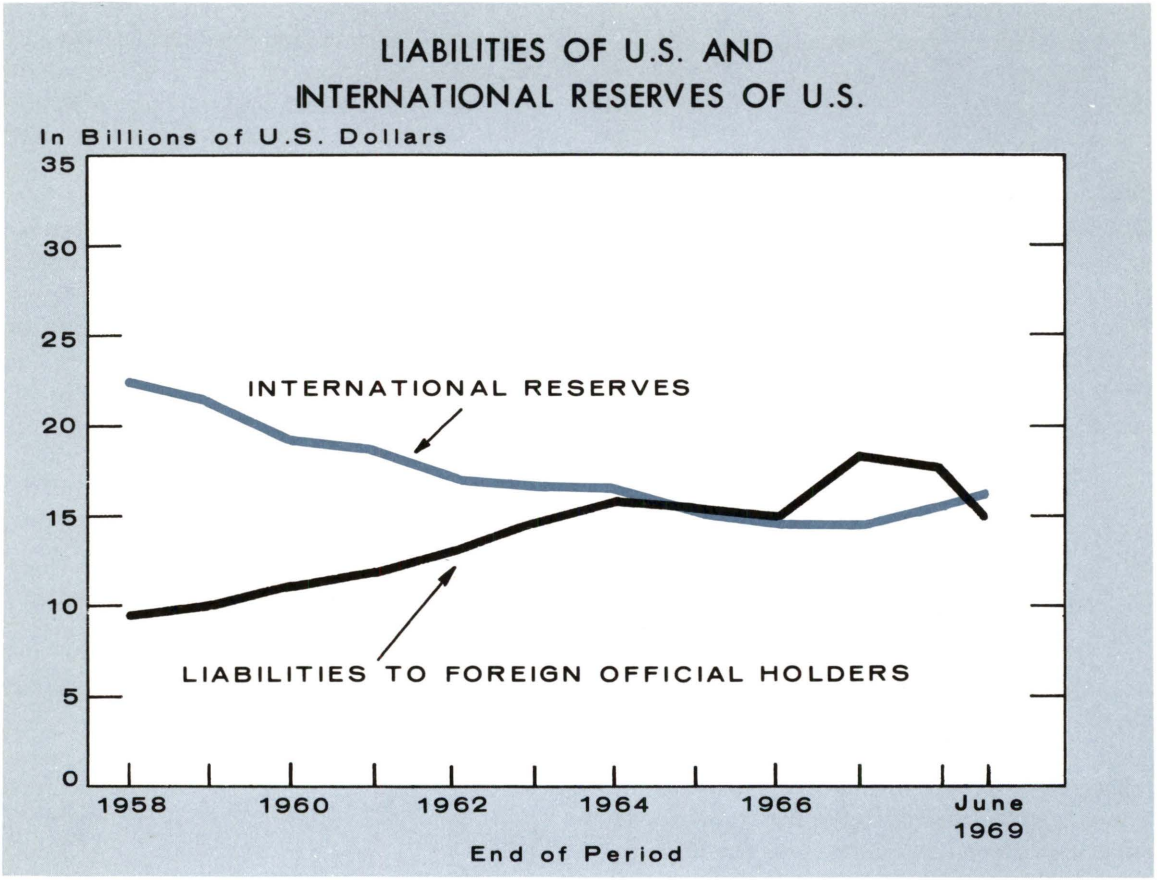
[5]Other factors, especially differences in capacity utilization through time between this country and the rest of the world, also contribute to the correlation between capital outflows and net exports. In these remarks we mention only a few factors which act to make net exports partly dependent on capital outflows.

[6]See Fritz Machlup, *The Transfer Gap of the United States*, Reprints in International Finance, No. 11 (Princeton, N. J.: Princeton University, 1968), and G. C. Hufbauer and F. M. Adler, *Overseas Manufacturing Investment and the Balance of Payments*, U. S. Treasury Department Tax Policy Research Study Number One (Washington, D. C.: U. S. Government Printing Office, 1968).

[7]Rolf Piekarz and Lois Ernstoff Stekler, "Induced Changes in Trade and Payments," *The Review of Economics and Statistics*, XLIX (November, 1967), 517-26.

Chart 3



the current rate of inflation in this country were moderated relative to the rate abroad, the trade surplus would surely expand, other things remaining the same. A relaxation of the restraints over capital outflows would probably also enhance the trade surplus; at least in the short run, however, the increase in capital outflows would probably exceed the resulting increase in the trade surplus, so that the immediate impact on the U. S. balance of payments would be to augment the deficit.

The foregoing discussion does not consider all of the influences which may be responsible for the shrinkage of the U. S. trade surplus. For example, the formation of the European Common Market and the European Free Trade Association, as well as changes in tastes, in technology, and in resource availabilities, would also have to be examined in the course of a thorough analysis. The purpose in this article is merely to set forth some of the more important or commonly mentioned influences. In the same spirit, the following section briefly considers the state of international reserves and the relationship between these reserves and the U. S. balance-of-payments deficit.

International Reserves and the U. S. Balance-of-Payments Deficit

As a result of the continuing deficits in the U. S. balance of payments, the country's international reserves have declined and its liabilities to foreign officials have risen, although in recent years these trends have been interrupted, if not reversed. (See Chart 3.) The Nation's international reserves, of course, are held by the Federal Government and consist of gold, convertible foreign currencies, and automatic borrowing rights at the International Monetary Fund. Liabilities to foreign officials take the form of U. S. Government securities and other U. S. dollar assets held by these officials.

Chart 3 clearly reveals why the U. S. Government has been so concerned with the balance of payments. In theory, foreign officials could present their claims for payment at any time, and U. S. reserves would be barely adequate to meet their demands. In practice, of course, it is most unlikely that all would demand payment simultaneously.

Chart 4 shows not merely the international reserves of the United States but those of the entire non-Communist world; international reserves, of course, are reserves which are used to settle accounts between countries. It is clear that these reserves have grown very slowly in recent years. However, more than 70 nations have recently agreed to create a new form of reserves, "special drawing rights," in the amount of $3½ billion in 1970, $3 billion in 1971, and $3 billion again in 1972. These special drawing rights, or SDR's, will probably constitute the major part of the additions to international reserves in these years. They will carry a gold value guarantee, will earn interest, and will be allocated to participating countries in proportion to their quotas in the International Monetary Fund. Subject to certain limits, participating countries must accept them as legal tender in settiing international accounts.

Not only have international reserves been expanding very slowly, but Chart 4 also shows that official holdings of gold have declined since 1965. As a result, what growth there has been in international reserves in recent years has been in holdings of foreign exchange. Now the foreign exchange which is held by governments as international reserves consists almost entirely of claims on the United States and on the United Kingdom, and these claims, of course, are the result of U. S. and U. K. deficits.

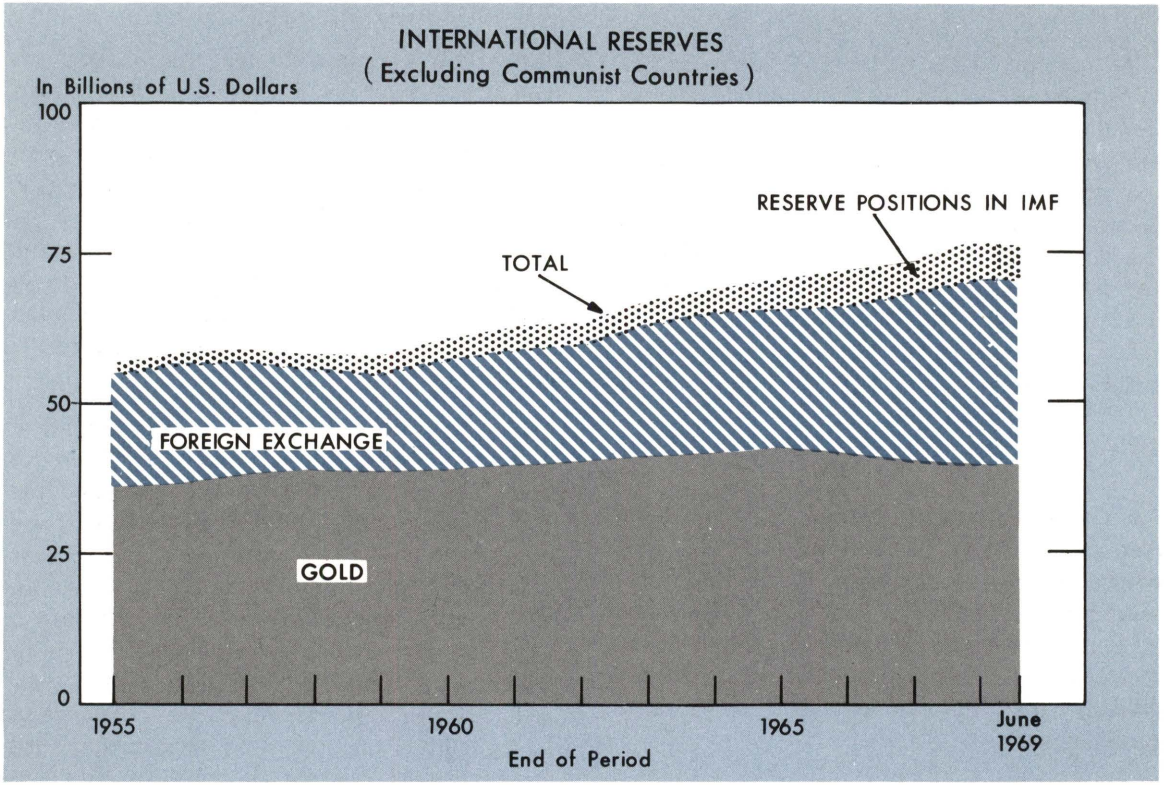
In other words, virtually the only sources of new reserves for the non-Communist world have been the deficits of the United States and the United Kingdom. But these two countries have been under pressure to reduce or eliminate their deficits. If they succeed, as the United Kingdom has recently done, they will no longer supply a large volume of reserves to the rest of the world. On the other hand, if they fail to curtail their deficits, other countries may lose confidence in the strength of the dollar and the pound and try to obtain gold in exchange for them, in which case international reserves might decline sharply as holdings of dollars and pounds were reduced. Thus the problem of the U. S. balance-of-payments deficit is closely related to the problem of providing adequate international reserves.

It is to meet this dilemma that special drawing rights were designed. Unlike the dollar and the pound sterling, they will not be the obligation of any one country, but will have the backing of the entire non-Communist world, so that they should not be subject to the loss of confidence that might afflict the dollar or the pound.

The Appropriate Volume of Reserves and Their Distribution

Exactly what volume of international reserves is needed is a difficult question to answer. It is

Chart 4



sometimes argued that these reserves should expand as rapidly as world trade, in order to finance the growing volume of trade. If this argument is correct, international reserves have been growing too slowly, for reserves taken as a percent of world imports have declined from 47 percent in 1955 to 35 percent in 1968 (not counting reserves or imports of Communist countries).

Actually, reserves probably do not need to increase as rapidly as trade, because international payments are netted, or cleared, so that it is only temporary balance-of-payments deficits, not all trade, which have to be financed by the use of reserves. Moreover, there has been too much inflation in the world in recent years to believe that reserves have been seriously inadequate; a serious reserve shortage would probably have induced more governments to follow deflationary policies in an attempt to realize balance-of-payments surpluses and thereby to accumulate reserves. Still, as trade grows, the magnitude of the balance-of-payments deficits in the world probably also tends to grow, and since these deficits must be temporarily financed, international reserves should probably expand a little more rapidly in the future. This, of course, is another argument for SDR's.

How will the new SDR's be distributed? Before answering this question, we might note that the distribution of international reserves has changed quite radically since 1953. As shown in

Chart 5

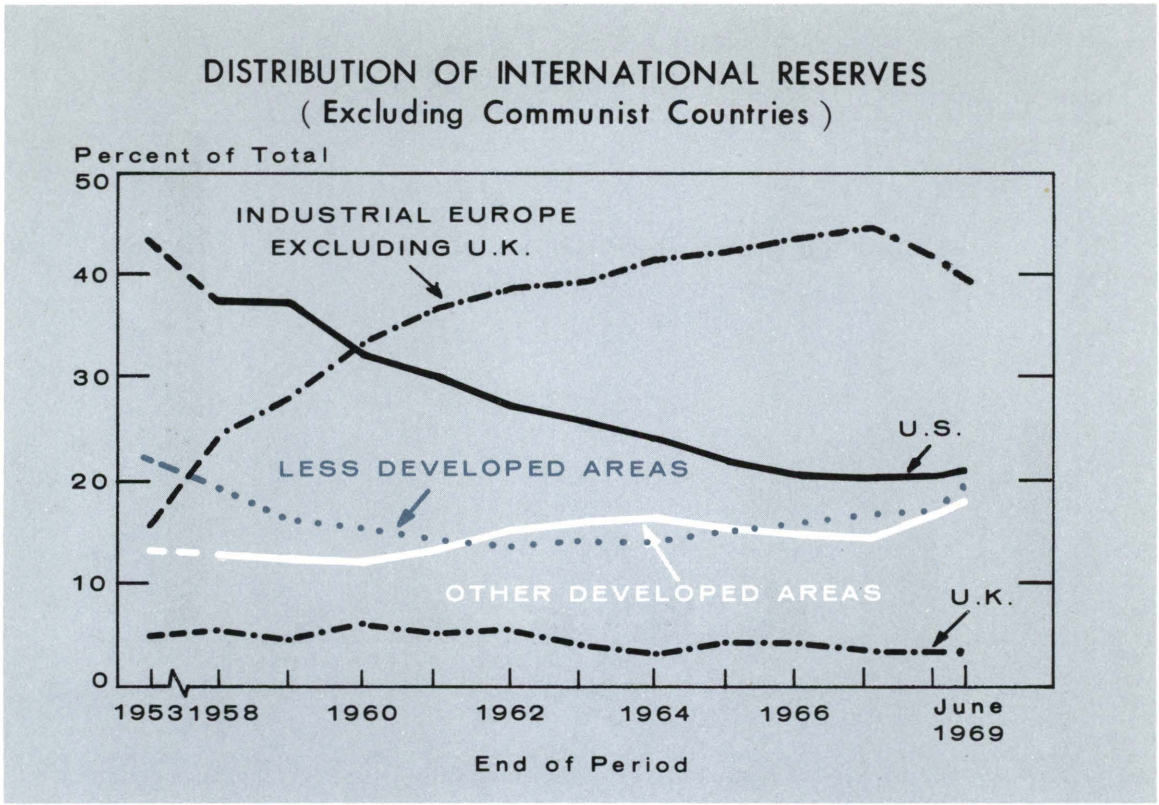
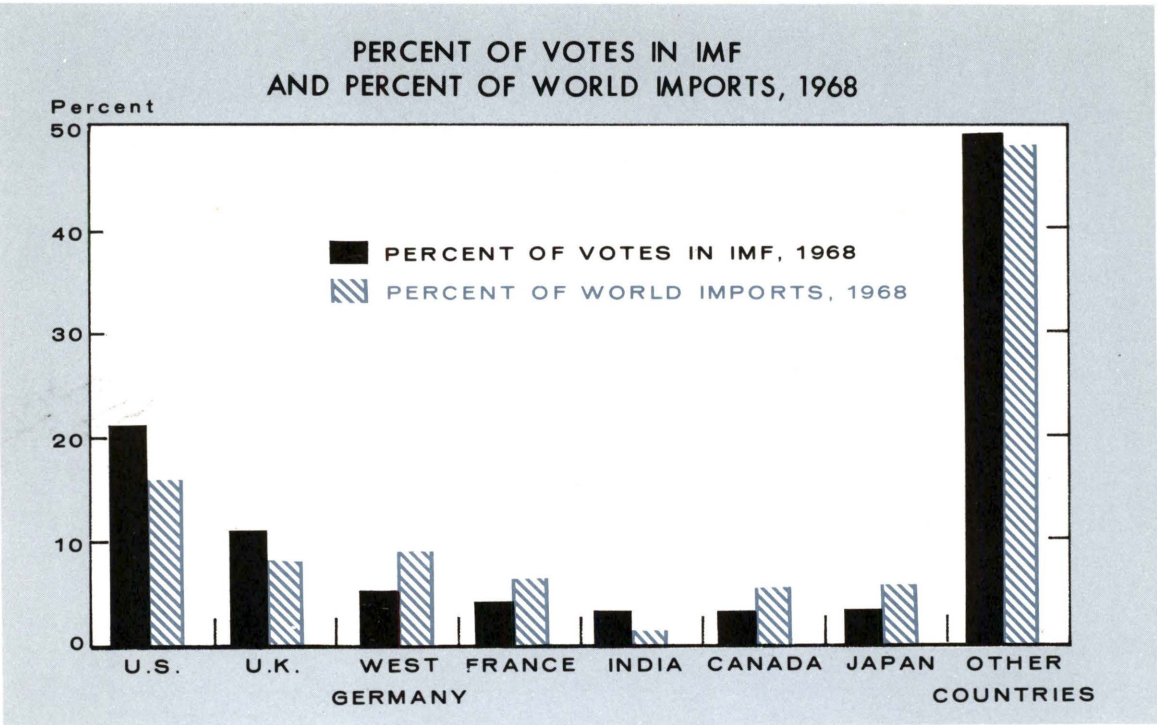


Chart 5, the U. S. share of the total has fallen from about 44 percent to about 21 percent, while over the same period the share of industrial Europe, not counting the United Kingdom, has risen from 15 percent to 39 percent. Recently, however, industrial Europe has been losing reserves to other areas.

SDR's will be created and distributed through the International Monetary Fund, or IMF. Because the IMF will administer these new reserve assets, it is interesting to see how the voting power within the organization is distributed among the member countries. (See Chart 6.) While the United States has a much larger share of the votes than any other country, it is not in a position to dictate to the other members. Even joining forces with other large countries would not permit the United States to have its way easily, since key decisions require a very large majority. For example, 85 percent of the total votes is required to authorize the creation of special drawing rights. On the other hand, since such large majorities are required to make major changes, the United States is in a position to veto a fundamental action which it regards as mistaken.

The votes within the IMF are allocated approximately in proportion to the financial contributions, or quotas, which members have paid. Because SDR's will also be allocated in propor-

Chart 6



tion to these quotas, the United States will receive a little less than 25 percent of all SDR's created. Thus when $3½ billion in SDR's is created in 1970, the U. S. share will be about $850 million.

Some countries have objected that they are now underrepresented in the IMF and that they will not receive a fair share of the new SDR's. They argue that they should have more votes and larger quotas in the IMF to reflect their importance in the world economy. What standards to use in measuring a country's economic importance is a debatable matter, but it is clear from Chart 6 that the voting power of several countries is much lower than their share of world trade. In this category are West Germany, France, Canada, and Japan, each of which has grown rapidly since the IMF was established. Consequently, it appears that such countries will soon experience relatively larger increases in their IMF quotas than other countries.

In conclusion, to return to an earlier theme of this article, the creation of SDR's may help the United States to reduce its balance-of-payments deficit. The reason is that SDR's will add to the international reserves of all countries, and after receiving these reserves other countries may decide that they can afford to run deficits or smaller surpluses in their balances of payments; and if with the cooperation of the United States they do run deficits or smaller surpluses, the U. S. balance of payments with them will of course improve. Once again, the relationship between the U. S. balance-of-payments deficit and the state of international reserves becomes apparent.

New England Economic Review

INDEX—1969