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THE FEDERAL RESERVE'S ATTACHMENT
TO THE FREE RESERVE CONCEPT

A STAFF ANALYSIS

SUBCOMMITTEE ON DOMESTIC FINANCE
COMMITTEE ON BANKING AND CURRENCY
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LETTER OF TRANSMITTAL

MAY 2, 1964.

To the Members of the Subcommittee on Domestic Finance:

Transmitted herewith for the use of the subcommittee is a staff analysis of the role of the "free reserves" concept in Federal Reserve policymaking. The Federal Reserve has indicated that "free reserves" is accorded a central position as an objective of monetary policy. The study raises critical and stimulating questions about the validity of assigning so important a role to this concept.

This analysis is the second part of a three-part study of the guidelines used by the Federal Reserve in formulating its policy. The first installment, published on February 10, analyzed some of the concepts used by the Open Market Committee in executing monetary policy and proved very useful to subcommittee members. Because this installment is equally relevant to the current hearings on the Federal Reserve System, it is being published separately at this time.

It should be pointed out that many of the Open Market Committee's activities are conducted in secret and therefore not known to the Congress or to this subcommittee. For this reason, it is necessary for staff investigators and other students of monetary policy to rely on general statements of Federal Reserve authorities, announced policy actions, reasons given for such actions by Federal Reserve officials, and the independent analysis of factual information.

Sincerely,

WRIGHT PATMAN.

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LETTER OF TRANSMITTAL

HON. WRIGHT PATMAN,
*Chairman, House Banking and Currency Committee,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: The material transmitted herewith represents the second part of a three-part study, "An Analysis of Federal Reserve Monetary Policymaking," that is being prepared for the committee. These chapters attempt to develop in more detail the nature of the conception that guides Federal Reserve actions, the position of free reserves in their analysis, and the relevance of the modified free reserve conception as an explanation of changes in money and credit.

In the subcommittee print of February 10, "Some General Features of the Federal Reserve's Approach to Policy," we discussed some of the diverse and often disconnected strands that play a prominent role in policy discussions by spokesmen and officials of the System. We found that one recurrent theme appears to occupy a dominant position in their notions about the monetary process: the asserted relation between the level of free reserves and the rate of credit expansion. While this relation has by no means been developed into a coherent frame for analysis of the monetary process, the persistent references suggest that it occupies a central position in the Federal Reserve's analysis.

Section 1, "The Federal Reserve's Attachment to the Free Reserve Concept: Evidence From Published Statements," develops the meaning of the free reserve doctrine as it is used within the System. Three separable roles are assigned to free reserves. First, and most important, free reserves are regarded as an important causal factor affecting credit expansion and contraction. Second, free reserves are used as an indicator of a given monetary situation. Third, they are used as a target of Federal Reserve policy. Much of the confusion engendered by the contemporaneous denials and explicit affirmations of the role of free reserve results from the three uses of the term. For example, the use of free reserves as a target may be denied without affecting the role of free reserves as the centerpiece of the causal mechanism used by the Federal Reserve.

This section indicates that the free reserve conception evolved out of an older notion developed most coherently by Riefler in the twenties. The character of this evolution is of particular importance, since many of the notions that formed a part of older views continue to dominate current thinking, long after their rationale has disappeared. Moreover, the discussion of the evolving notions helps to explicate some of the actions of the Federal Reserve in the thirties and forties. For example, the severely deflationary action of the mid-thirties, the doubling of reserve requirements, was appraised by the Federal Reserve in terms of the dominant Riefler notion. Had this notion been well founded, and applicable to the then current events, the doubling of

reserve requirements would not have had severely deflationary consequences. But the notion was inapplicable and incorrect. Increased unemployment and a reduction in the pace of economic activity ensued.

Dramatic events, like the doubling of reserve requirements in the thirties, do not take place at frequent intervals. But they serve to indicate the importance of a validated conception of the monetary mechanism and to illustrate the costs to society resulting from the application of invalid, untested theories.

The remainder of section 1 presents evidence from published Federal Reserve statements and from the as yet unpublished responses, by the members of the Board of Governors and the presidents of the Reserve Banks, to a series of questions posed in connection with this study. The recent modifications of the doctrine, associated with the recognition that the demand for free reserves play a role in the monetary process, are discussed. We find that the recognition of demand factors has introduced important additional elements into the Federal Reserve's analysis.

A major conclusion of the section is that many of the new notions that have been introduced conflict with older views. These conflicts remain unresolved within the Federal Reserve. Had the Federal Reserve attempted to develop and test their conception, many such conflicts would be recognized, and resolved on the basis of evidence; analysis and understanding would be improved, and the foundations of monetary policy making would be strengthened. The failure of the Federal Reserve to carry out systematic appraisals of the mechanism that has been entrusted to their control perpetuates incorrect and poorly developed views, and renders monetary policy less useful as a tool of economic policy.

In contrast to section 1 that looks at the evidence from the professed views of officials and spokesmen, section 2 concentrates principally on the actions taken by the Federal Reserve. We noted in chapter II that the Federal Reserve has an extremely short-run policy focus, that actions are taken in response to weekly, daily, and even hourly events on the financial markets. Section 2 builds on the earlier discussion and reveals the way in which concentration on short-run occurrences and the absence of systematic analysis leads to a substantial grant of authority to the Manager of the System Open Market Account.

A principal piece of supporting evidence for our view of the position of the Manager, his reliance on free reserves as an indicator, and his use of free reserves as a target, is of particular importance. A comparison of decisions by the Federal Open Market Committee with the recorded movement of free reserves indicates that the level of free reserves quite often moved decisively in advance of a decision by the Open Market Committee to "ease" or "restrain." The observed pattern strongly supports our interpretation that the absence of a systematic framework and the concentration on extremely short run market events has resulted in a substantial grant of authority to the Manager. At major turning points, in the post-Accord period, it has often been the Manager's action that reversed the direction of policy. This action was then ratified at a meeting of the Federal Open Market Committee. Contrary to published statements by officials of the System, the Manager appears to occupy a major policymaking role.

Our appraisal of the Federal Reserve's record at post-Accord turning points in economic activity suggests that, in this respect, the Federal Reserve has compiled a good, even excellent record. They have been alert and sensitive to a variety of indicators, and they have made timely and appropriate judgments about the pace of economic activity. We contend that in the present state of knowledge, it would be difficult to improve upon their record in this respect.

However, recognition of the turning points in the pace of economic activity must be accompanied by appropriate action to alter the money supply, if discretionary monetary policy is to have an appropriate countercyclical influence. The Federal Reserve does not directly control the stocks of money or credit. Without a valid conception of the relation between their actions and the stock of money and credit, the usefulness of their judgment of the timing of turning points in economic activity is diminished. Unless appropriate action is taken, our economy does not benefit from their timely recognition of the turning point.

The type of action that is taken depends on the conception of the monetary process that is held. If that conception is seriously deficient, it is quite likely that correct judgment of turning points will not be accompanied by action appropriate to reduce unemployment or to prevent inflation. Section 3, "The Relation of Free Reserves to Changes in Money and Credit," therefore provides some evidence on the validity of the modified free reserves conception.

The evidence is quite clear. The modified free reserves mechanism bears almost no relation to changes in the stock of bank credit or money. Indeed, the relation is so poor that it raises questions about the usefulness of Federal Reserve policy as a means of controlling money or credit. Judged in terms of the Federal Reserve conception, an overwhelming proportion of observed changes in money and credit are outside the control of the Federal Reserve. If their view of the monetary mechanism were the only admissible view, we would be forced to concede that monetary policy is little more than a futile exercise.

Fortunately, alternative conceptions of the monetary mechanism with substantially greater validity can be formulated. One such conception will be presented in a later chapter. It will suggest that Federal Reserve policy has an important influence on the stock of money. But to obtain this influence, i.e., to carry out the congressional mandate, the Federal Reserve must abandon the modified free reserves conception and operate in terms of a markedly different conception.

The evidence presented in Section 3 supports our contention that the conception that dominates Federal Reserve discussion and thinking about the monetary mechanism is woefully inadequate and without factual foundation. The failure of the Federal Reserve to develop an adequate appraisal of the monetary mechanism seriously reduces the value of their recognition of turning points, leads to inappropriate policy actions and renders discretionary monetary policy a less useful tool for carrying out the congressional mandate.

KARL BRUNNER.
ALLAN H. MELTZER.

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THE FEDERAL RESERVE'S ATTACHMENT TO THE FREE RESERVE CONCEPT

SECTION 1—EVIDENCE FROM PUBLISHED STATEMENTS

One of the dominant Federal Reserve conceptions centers on the role of free reserves in the monetary process. This idea has had an important influence on assessments made by the Federal Reserve authorities and on the policies applied in concrete situations. We contend that the Federal Reserve has viewed, and continues to view, free reserves as an element playing a causal role of central importance in the monetary process and simultaneously supplying a useful summary measure of "ease and restraint." Detailed evidence is presented in this and a subsequent chapter in support of our contention.

The evidence presented in this chapter comes almost exclusively from the statements made by members of the Board of Governors, the FOMC, and their staffs. It would be useful, perhaps, to supplement these statements by indications of the importance attached to free reserves, both as an index and as a causal factor, by Members of the Congress, the banking community, the academic profession and others. But to do so seems beyond the scope of this inquiry and adds little direct evidence to the point. In the following section, a second type of evidence will be presented, evidence from the record of policy actions and the actual movements of the level of free reserves in the postwar period.

Free reserves are defined as the difference between measured excess reserves and member bank borrowings. They are the volume of measured excess reserves not borrowed from the Federal Reserve. To obtain the volume of free reserves, the amount of required reserves and the amount of member bank borrowing are subtracted from total reserves.

In the context of the dominant notion to be considered, the level of free reserves is viewed as a causal factor affecting the rate at which commercial banks adjust their portfolios of earning assets. An increase in free reserves is expected to accelerate the expansion rate of bank portfolios; i.e., to increase the rate at which banks acquire earning assets or decrease the rate at which they unload securities and/or compress outstanding loans. A decline in free reserves, on the other hand, is expected to retard the expansion rate; either the rate of acquisition will be lower or portfolios contract. A systematic association thus links the level of free reserves with the rate of change on the commercial banks' portfolio of earning assets.

The association of free reserves with the banks' asset expansion, combined with the causal role assigned to free reserves, influenced the choice of free reserves as an index of the monetary situation—a summary measure indicating relative "ease" or "restraint." According to the Federal Reserve's notion, policy actions and other events modify the monetary process to the extent that they change

the prevailing level of free reserves. Open market operations immediately change total reserves and free reserves by the same amount. Banks respond by modifying the adjustment rate of their portfolios. As a result, required reserves and borrowing change, and the initial impact of open market operations on free reserves is attenuated. However, free reserves do not return to their initial level even after the impulse triggered by open market operations has been fully absorbed.

Changes in reserve requirements immediately change the volume of required reserves relative to an unchanged volume of total reserves. There is no direct effect on borrowings from Federal Reserve Banks. Thus there is an instantaneous change in free reserves that affects the banks' portfolio adjustment. Subsequently, part of the initial change in free reserves is absorbed, via the gradual shift in required reserves associated with changes in deposits induced by the portfolio adjustments.

The effect of other events, gold flows, currency flows, a redistribution of the public's deposits between demand and time accounts, the division of the Treasury's balances between holdings at Federal Reserve Banks or on tax and loan accounts at commercial banks, etc., can be traced in a similar manner. A necessary and sufficient condition for all these events to exert an influence on the money supply and credit markets is the existence of an immediate impact on the level of free reserves. This, in essence, is the foundation of the free reserve conception of the monetary process.

GENESIS AND DEVELOPMENT OF THE FREE RESERVE CONCEPTION OF MONETARY PROCESSES

A short description of genesis and development of the "free reserve doctrine" seems appropriate before we discuss the evidence supporting our contention about the dominant role of this "doctrine" among Federal Reserve views.¹ This description focuses attention on the behavior patterns and operating problems that stimulated the development of the free reserve doctrine. Recent emergence of important modifications will also be noted. However these modifications of the free reserve doctrine have neither been systematically developed nor absorbed into a coherent view. Conceivably, these new elements will lead, in the future, to a reassessment of the Federal Reserve's viewpoint about the role and significance of free reserves.

The origins of the free reserve "doctrine" may be traced to the discovery of open market operations. Such operations emerged in the early twenties as a result of the Reserve Banks' endeavor to bolster their revenues with suitable earning assets. The Federal Reserve authorities rapidly realized that open market operations immediately affect the commercial banks' reserve position. Purchases inject additional reserves, and sales siphon off available reserves. Open market operations thus appeared to offer an excellent opportunity to modify the commercial banks' positions in the direction and

¹ The reader may usefully consult A. J. Meigs, "Free Reserves and the Money Supply" (Chicago: University of Chicago Press, 1962), ch. 2. A detailed exposition and analysis of several free reserve theories is also presented in our forthcoming paper "Evolving Federal Reserve Conceptions About the Monetary Process." It is shown in this paper that a number of typical assertions made by Federal Reserve authorities can be subsumed under these theories. Furthermore, the explicit construction of usually vague and elliptical notions permits a detailed empirical evaluation of their comparative validity. Subsequent references will be made simply to "Evolving * * *."

extent desired by the Federal Reserve authorities. But the gradually accumulating observations concerning the commercial banks' reserve and borrowing behavior slowly dispelled this belief. Open market operations typically induced a response in bank borrowing from the Federal Reserve Banks which seriously mitigated the impact of open market operations on the total volume of reserves. Purchases generated a repayment of outstanding loans and sales "forced banks into the central bank" and induced an increased volume of borrowing. Open market operations were systematically associated with offsetting variations in the banks' borrowing from the Federal Reserve Banks.

The banks' behavior almost annihilated any potential effect of open market operations on the volume of bank reserves in the twenties.² But the composition of reserves between borrowed and unborrowed reserves changed decisively. Open market sales by the Federal Reserve gave rise to increased borrowing by member banks that approximately restored total reserves. Excess reserves were small during the period and exhibited negligible variations. Hence variations in bank indebtedness were practically equivalent to variations in free reserves. (Of course the values of free reserves and member bank indebtedness moved in opposite directions as would be expected from the definition of free reserves and the relatively unchanging value of excess reserves.)

Under the circumstances of the period, the volume of bank reserves did not appear to play any important role in the transmission of the impulses set off by open market operations. Students of monetary policy were seemingly forced to recognize the futility of open market operations or to search for an alternative route transmitting the impact generated by open market operations.

RIEFLER'S CONTRIBUTION TO THE ANALYSIS

The behavior patterns summarized above appeared to hint at an alternative route which was explored in a pathbreaking study of our monetary system by W. Riefler.³ This alternative view made variations in banks' indebtedness the focal point of the money supply and credit market process. But Riefler fully realized that bank indebtedness could only assume an important role in explaining the effective transmission of Federal Reserve policy if the banks had little control over the volume of their indebtedness to the Reserve Banks. In the early part of his book, therefore, he devoted much attention to the rationale for member bank borrowing. Two hypotheses are

² Two regressions were computed in order to appraise the order of magnitude and significance of compensating variations in the Federal Reserve's "discounts and advances," denoted by A for the period of the 1920's. The regressions relate first differences of A between adjacent months or corresponding months of adjacent years with similar first differences of the adjusted base B^* . The latter magnitude is equal to the base minus discounts and advances. It is thus equal to the sum constituted by the Federal Reserve's portfolio of securities including float, the Treasury's gold stock net of Treasury cash, Treasury currency outstanding, the negative value of Treasury deposits and foreign deposit at Federal Reserve Banks, and some minor other accounts including "other deposits" at Federal Reserve Banks. The result of the regressions are collected below:

$$\begin{aligned} \Delta A_t, t-1 &= .0086 - .8742 \Delta B^*_{t-1}, t-1 \\ & \quad (.0070) (.0962) \\ & \quad F^2 = .3697 \\ \Delta A_t, t-12 &= .1057 - 1.1729 \Delta B^*_{t-1}, t-12 \\ & \quad (.0357) (.0830) \\ & \quad F^2 = .6039 \end{aligned}$$

where

$$\begin{aligned} \Delta A_t, t-1 &= A_t - A_{t-1}; \Delta B^*_{t-1}, t-1 = B^*_{t-1} - B^*_{t-2} \\ \Delta A_t, t-12 &= A_t - A_{t-12}; \Delta B^*_{t-1}, t-12 = B^*_{t-1} - B^*_{t-13} \end{aligned}$$

Sample period: January 1918 to December 1929.

³ W. W. Riefler, "Money Rates and Money Markets in the United States" (New York: Harper & Bros., 1930).

considered, a profit hypothesis and a "needs and reluctance" hypothesis. The alternative views may be summarized in his own words:

The most obvious theory is that member banks, on the whole, borrow at the Reserve Banks when it is profitable to do so and repay their indebtedness as soon as the operation proves costly. The cost of borrowing at the Reserve Banks, accordingly, is held to be the determining factor in the relation between Reserve Bank operations to money rates, and the discount rate policy adopted by the Reserve Banks to be the most important factor in making Reserve Bank policy effective in the money markets. At the other extreme, there is the theory that member banks borrow at Reserve Banks only in case of necessity and endeavor to repay their borrowing as soon as possible. According to this theory the fact of borrowing in and of itself—the necessity imposed by circumstances on member banks for resorting to the resources of Reserve Banks—is a more important factor in the money market than the discount rate * * * and open market operations * * * contribute more directly to the effectiveness of Reserve Bank credit policy than changes in discount rate.⁴

After the sketch of the two theories, Riefler discusses the implications of the profit theory and notes that under this theory interest rates on the open market should be close to the discount rate, with only minor or transitory deviations.⁵ A confrontation of this conclusion with observable rate behavior on short-term open markets leads Riefler to reject the profit theory.

We may easily concede the pertinent facts and admit that the open market rates diverged markedly and persistently from the discount rate. On the other hand, the behavior of the acceptance market was consistent with the implication of the profit theory as formulated by Riefler; i.e., the pertinent market rates followed closely and deviated only little from the Federal Reserve's acceptance rate.⁶

Riefler concludes his appraisal of the rival conceptions concerning the process generating the banks' indebtedness to Federal Reserve Banks with a decision in favor of the "needs and reluctance" theory of bank borrowing:

There is little question, on the whole, that the first of the two theories outlined above, covering the relation of Reserve Bank rates to money rates in the money markets, applies to the rates at which acceptances sell in the open

⁴ *Ibid.*, pp. 19-20.

⁵ "If member bank borrowing has been governed primarily by motives of profit during this period, money rates would have been dominated by the discount rates charged by the Reserve Banks. Particularly would this have been true of rates in the short-term open markets where member banks can lend freely and withdraw funds entirely on their own volition without regard to the results of their actions on future lending operations. As member banks had plenty of eligible paper on which to borrow at the Reserve Banks during most of this period, there was nothing to prevent them from 'scalping' a profit out of the open market whenever rates in those markets were above discount rates. If member bank borrowing had actually been governed by the profit motive in this manner, offers of additional funds in the short-term open markets would have been so plentiful whenever opportunity presented itself that rates in those markets could never have risen far above discount rates, so long as eligible paper continued available in ample supply. Nor could rates in the short-term open markets have fallen much below discount rates so long as an appreciable volume of member bank borrowing at the Reserve Banks represented indebtedness incurred under the profit motive, since member banks would have withdrawn funds from the short-term open markets to repay indebtedness at the Reserve Banks whenever continued borrowing became unprofitable, and rates in those markets could not have fallen much below discount rates until member banks had liquidated a considerable proportion of their indebtedness." Riefler, *op. cit.*, pp. 20-21.

⁶ "The relationship which this theory (i.e., the 'profit theory') envisages between the discount rates of the Reserve Banks, on the one hand, and the money rates in the short-term open markets, on the other, is essentially that which prevailed in the acceptance market in this country." Riefler, *op. cit.*, ch. 2, p. 21.

market. It does not, however, as might be expected, apply with anything approaching the same precision to rates in other short-term markets which have varied widely from discount rates? * * * it is impossible to explain the movements of money rates in the open market and the levels which they have occupied during recent years by the movements and levels of discount rates at the Reserve Banks alone.⁸

Then his main conclusion with respect to the two alternatives:

The functioning of the Reserve Banks in the money market must, therefore, be considered from the point of view of the theory that changes in the volume of member bank borrowing exert a more important influence on rates than do changes in discount rate.⁹

In the remainder of his book, Riefler developed an analysis of the monetary process connecting Federal Reserve operations with the money supply and the behavior of the banks and the public. Though incomplete and deficient in several important respects and dominated by very short-run considerations, his analysis was an extremely useful and important beginning. Unfortunately the theory construction that he began has not been completed by others. Instead, several of the notions that he introduced were uncritically accepted by the Federal Reserve and have continued to appear in their discussions despite their inconsistency with other elements that have been introduced. Of particular interest in the light of later developments, is the emphasis placed on the expansion or contraction of bank credit in response to changes in the volume of member bank borrowing at the Reserve Banks. While we make no attempt to present the theory in detail,¹⁰ consideration of his central idea is a useful introduction to later discussions by Federal Reserve officials.

Riefler's theory contains four major elements. The first, and by far the most important, seeks to explain the relation of market rates of interest and the volume of bank indebtedness. Larger bank indebtedness and a higher discount rate are said to raise the prevailing market rates; smaller indebtedness and lower discount rates depress market rates. "(T)he volume of member bank indebtedness at the Reserve Banks at any given time is one of the most important single monetary factors in the level of money rates, and * * * the prospect of increase or decrease in the indebtedness is one of the most important single factors in the rate outlook."¹¹ Open market operations by the central bank were at the root of the rate changes since, under the "needs and reluctance" notion, member banks borrowed when open market operations reduced member bank reserves and repaid borrowing when the central bank increased reserves. Riefler stated the point as follows:

(F)luctuations of money rates in the short-term open markets should be governed by corresponding fluctuations in the aggregate volume of member bank indebtedness at the

⁸ *Ibid.*, p. 23.

⁹ *Ibid.*, p. 25.

¹⁰ *Ibid.*

¹¹ A detailed analysis of the Riefler conception is contained in our paper "Evolving * * *"

Riefler, *op. cit.*, p. 27. See p. 124 also.

Reserve Banks, increased borrowing there being reflected in a rise of money market rates and decreased borrowing in a decline of rates in these markets. This would be expected because * * * member banks do not borrow in order to increase their loans, but rather endeavor to contract their loans in order to repay their indebtedness.¹²

A second element concerns the public's response to the changes in market rates initiated by the Reserve Banks. Higher interest rates were said to reduce the demand for bank credit either directly or indirectly because the public sold fewer securities to the banks. Lower rates expanded the quantity of bank credit demanded. Given the volume of bank indebtedness to the Reserve Banks, the "quality evaluation" of loan applications by commercial banks and the public's behavior determined the volume of earning assets held by banks and the total deposit liabilities.

The volume of acceptances held by the Reserve Banks was the third main element. The Federal Reserve set a rate at which it was willing to buy acceptances. When market rates rose relative to the acceptance rate, banks sold acceptances to the Reserve Banks and total reserves increased. The Federal Reserve's portfolio of acceptances thus was determined by the prevailing market conditions and the acceptance rate.

The last main building block introduced by Riefler is designed to explain the variations in member bank indebtedness. The amount of indebtedness is shown to be equal to required reserves plus currency held by the public minus the Federal Reserve's holdings of Government securities and float, minus the gold stock net of Treasury cash, minus Treasury currency outstanding, plus Treasury and foreign deposits at the Federal Reserve Banks, plus "other deposits" and "other accounts" on the balance sheet of the Federal Reserve Banks. For Riefler this relationship is not simply a balance sheet identity from the consolidated Federal Reserve statement. It reveals a causal relation that determines the volume of member bank borrowing. Banks have no desire to borrow from the Reserve Banks; variations in the pressure to borrow emanate from changes in the elements described. When "favorable" circumstances permit—e.g., when the currency flows into the banks from the public, when there is a gold inflow or an open market operation, etc.—the banks follow their fundamental disposition, viz., they reduce indebtedness.

The four building blocks jointly operate to determine the response of the monetary system to the policy actions taken by the Federal Reserve authorities. The transmission of typical policy actions to the credit markets and the money supply may be traced with the aid of Riefler's framework. Open market purchases lower the banks' indebtedness dollar for dollar; lower indebtedness induces banks to lower the yields on money markets; the public responds with a larger supply of earning assets to banks; the banks' asset portfolio and deposit liabilities expand. Open market purchases thus expand "bank

¹² *Idem.* Other references augment the clues about the central relation visualized by Riefler. For example, he writes " * * * changes in this indebtedness appear to be the initiating force in corresponding changes in money rates. It is this relationship apparently which has given to Reserve Bank operations in the open market that peculiar efficacy for control over the money market, which must be written more fully than it has been written into Reserve banking theory * * *. Induced through open market operations, the money markets, independently of changes in discount rates."

credit" and the money supply and lower the interest rates on the credit markets.

Riefler's exposition of central banking theory thus made the volume of member bank borrowing completely unresponsive to any direct influence of interest rates. Only to the extent that these rates operated on currency flows, gold movements, or the other balance sheet items listed above could they alter the amount of borrowing. This view carried over, in part at least, to the initial formulation of the free reserves doctrine.

Riefler is rather vague about the role of the discount rate in the process. At times he seems to suggest that the discount rate has no effect on the environment described by the four building blocks. Other suggestions hint that the discount rate operates independently of changes in bank indebtedness but not independent of the existence of borrowed reserves by the banks. Also missing from the Riefler discussion is any consideration of variations in the volume of excess reserves held by banks. As we have noted, fluctuations in excess reserves were relatively small during the twenties, and this may account for the lack of attention. Finally, a reading of Riefler's book shows that his discussion is dominated by concern with extremely short-run money market considerations. This emphasis has an important bearing on his acceptance of the "reluctance" theory of bank indebtedness that occupies a vital position in his analysis.¹³

BURGESS' VIEWS

Shortly after Riefler's book, a revised edition of Burgess' well-known study appeared.¹⁴ Burgess accepted most of the Riefler formulation of the monetary process and added a slightly more explicit treatment of the role of the rediscount rate. Like Riefler, he notes the close correspondence between the behavior of money market rates and the volume of indebtedness. He explains this association in terms of the banks' reluctance to borrow or to remain in debt.

When the member banks find themselves continuously in debt at the Reserve Banks, they take steps to pay off their indebtedness. They tend to sell securities, call loans, and restrict their purchases of commercial paper and other investments. The consequence is that when a large number of member banks are in debt, money generally becomes firmer, commercial paper sells rapidly, and rates increase. Conversely, when most of the member banks are out of debt at the Reserve Banks, they are in a position to invest their funds; and money rates, including commercial paper rates, become easier. This relationship rests largely on the unwillingness of banks to remain in debt at the Federal Reserve Banks.¹⁵

The central feature of Riefler's discussion—that Federal Reserve policy operates on the monetary system by inducing variations in member bank indebtedness—is repeated by Burgess.¹⁶ In addition,

¹³ This point is developed in our paper "Evolving"

¹⁴ W. R. Burgess, "The Reserve Banks and the Money Market" (New York: Harper & Bros.), rev. ed., 1936.

¹⁵ *Ibid.*, p. 220.

¹⁶ *Cf.* p. 236 and p. 238 for examples.

Burgess recognizes the operation of discount rate policy as a separate element in the process that is reinforced by open market operations.

The effectiveness of purchases and sales of Government securities as an instrument of policy lies usually in their influence on the indebtedness of member banks at the Reserve Banks. Purchases enable member banks to pay off loans and thus tend to make money easier; sales lead banks to borrow more heavily and thus tend to make money firmer. Government security transactions supplement and enforce discount policy.¹⁷

Elsewhere, after commenting on the principle of open market operations along the lines described by Riefler, Burgess notes:

It can thus be seen that buying and selling [by the Reserve Banks] is not only an independent influence on the credit situation, but may and often has been used as a means of preparing for discount rate changes and making them more effective.¹⁸

Variations in the rediscount rates were seen as an independent influence on "bank credit." Such influences operated in conjunction with open market policy. When open market operations reduced reserves, banks borrowed from the Reserve Banks, as Riefler had described. Open market operations were effective in changing interest rates and could be reinforced by fiat changes in the rediscount rate that made increased bank indebtedness more or less expensive and contributed to the variation of market rates.

The explicit recognition of the discount rate as a separate influence on market interest rates and on member bank borrowing might have stimulated further interest in the influence of costs and yields on banks' reserve positions and an analysis of the demand by banks for reserves. But the Riefler-Burgess conception was dominated by the "reluctance theory" of bank borrowing, and this further step was not taken. As a result, the role of "excess reserves" and the growth of such reserves during the thirties could not be interpreted in the prevailing Federal Reserve view.

GOLDENWEISER'S VIEWS

The persistence of the viewpoint explored by both Riefler and Burgess is clearly revealed by Goldenweiser's 1941 article.¹⁹ The major change is in the direction of weakening the description of the causal connection between open market operations, bank indebtedness, and "credit expansion" and increased emphasis on the bankers' "frame of mind."

* * * When the System wishes to ease credit conditions
 * * * it purchased Government securities in the open market and simultaneously reduced the discount rate at the Reserve Banks. It thus provided member banks with reserve funds to reduce their indebtedness at the Reserve Banks and also made such indebtedness as remained less

¹⁷ P. 253.

¹⁸ P. 238.

¹⁹ E. A. Goldenweiser, "Instruments of Federal Reserve Policy," in "Banking Studies," Washington: Board of Governors of the Federal Reserve System, 1941.



FREE RESERVE CONCEPT

burdensome to the member banks. This policy was intended to put member banks in a position and a frame of mind to be more liberal in extending credit.²⁰

Like Burgess, Goldenweiser is more explicit than Riefler about the role of discount rates in the central relation. Discount rate changes appear to affect market rates of interest by an amount that depends directly on the volume of bank indebtedness. This view is particularly interesting in view of later suggestions that the primary effect of changing the discount rate was the psychological impact associated with the announcement of the change.

Goldenweiser also stressed an important implication of the Riefler-Burgess conception which explains the Federal Reserve's policy in 1936-37. The absence of excess reserves and the existence of bank indebtedness are presented as necessary conditions for monetary policy to be effective. According to the Riefler-Burgess notion the evaporation of bank indebtedness during the 1930's broke the chain linking the Federal Reserve with the credit markets and the money supply.²¹ Restoration of an effectively working monetary policy thus required that "contact be reestablished with the market." Reestablishment of contact meant the potential emergence of bank indebtedness and the disappearance of large excess reserves. The drastic increase in reserve requirements arranged in the late summer of 1936 and the early months of 1937 seemed ideally designed, under the ruling notion developed by Riefler-Burgess and carried on by Goldenweiser, to render monetary policy more potent without exerting any deflationary damage. Goldenweiser asserted with particular emphasis that this dramatic jump in reserve requirements "was not a reversal of the policy of monetary ease pursued since the beginning of the depression. * * * The Board's action was precautionary in character and placed the system in a position where an injurious credit expansion, if it should occur, could be controlled by open market operations and discount rate policy."²²

Goldenweiser thus explicitly indicated that accumulating excess reserves and vanishing bank indebtedness broke a crucial link of the monetary process and rendered policy incapable of coping with potential problems.²³ Under the Riefler-Burgess conception excess reserves have no role to play in the monetary process. They are inconsistent with this view of the monetary mechanism. It is therefore intriguing to note that the emergence of excess reserves was immediately interpreted to mean a breakdown of policy mechanisms and not a denial or falsification of the Riefler-Burgess conception, that denies the existence of excess reserves.

The exclusion of excess reserves from systematic consideration was closely associated with the involuntary and imposed character attributed by the Federal Reserve to bank indebtedness. The implicit

²⁰ *Ibid.*, p. 400.

²¹ "After the autumn of 1933 these instruments (i.e., the discount rate and open market operation) were not usable, because the banks were out of debt and had a large volume of excess reserves. The banks were therefore largely independent of the Federal Reserve System's traditional method of credit regulation." Goldenweiser, *op. cit.*, p. 391. "A necessary condition for the effectiveness of such a policy (i.e., of encouraging credit expansion) is that the volume of excess reserves at the disposal of member banks be limited." *Ibid.*, p. 400.

²² *Ibid.*, p. 410.

²³ In passing we note two points. One, the concern with the possible problem of inflation appears to have dominated the concern for the existing problem of underutilization of resources. Two, those who continue to assert that monetary policy in recession is analogous to "pushing on a string" should be aware that the origin of this view is the Riefler-Burgess notion that denied any influence of interest rates on member bank borrowing or excess reserves and any relevance to the demand by banks for reserves.

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denial of any systematic response of the volume of bank indebtedness to market conditions was extended to cover excess reserves. It was therefore consistent for the Federal Reserve authorities to consider excess reserves throughout the thirties as a redundant surplus of no use and of no function in the monetary process. But excess reserves persisted and still exist, particularly among country banks.

The persistent occurrence of excess reserves must have slowly eroded the old version of the Riefler-Burgess conception. We find it difficult to obtain clear evidence of the gradual transformation of this dominant view into a notion emphasizing the central position of free reserves. This transformation must have occurred during the late 1940's or early 1950's.²⁴ In the new view excess reserves were treated as an extension of bank indebtedness, a magnitude offsetting the retarding influence of member bank borrowing. Free reserves assumed the position and role which originally had been assigned to bank indebtedness. The free reserve conception thus emanated as a result of an adjustment in the central building block of the Riefler-Burgess view of the monetary process.

Additional modifications occurred in the late 1950's. These changes are considered in detail later in this section, along with some suggestions of the direction in which the doctrine is currently moving. It should be noted, however, that while there are periodic changes in the prevailing views, the basic conception is almost never completely formulated and has never been subjected to a searching appraisal or even to the discursive arguments that Riefler provided for his views. No doubt, such an appraisal would show that the broad movements of interest rates and excess reserves during the 1930's are consistent with many of the transformations that have been made in the old notions. But this gain in empirical relevance is bought at a high cost; viz, it would be impossible to justify the Federal Reserve's policy in 1936-37 with the modified free reserve conception. The Federal Reserve authorities apparently never realized this implication of their evolving notions that substituted free reserves in place of bank indebtedness as a central magnitude in the causal process. Such unawareness is a typical symptom of the unsystematic and essentially impressionistic nature of their discourse concerning these problems. A clear and definite grasp of pertinent implications can only be obtained by tracing the conception as a whole in a coherent, systematic manner. The interactions of the distinct blocks composing the whole process must be carefully followed in order to fully understand the patterns implied by a given framework. To date, the Federal Reserve has not done this.

THE CAUSAL POSITION OF FREE RESERVES: FREE RESERVES AS AN INDEX OF A MONETARY SITUATION AND FREE RESERVES AS A POLICY TARGET

To understand the role of free reserves in Federal Reserve discussions, it is important to separate three distinct meanings assigned to the term. Each of these meanings involves the use of the term in a different way, with markedly different connotations. It is symptomatic of the manner in which the Federal Reserve discusses the mone-

²⁴ Irving Auerbach of the Federal Reserve Bank of New York is often given credit for the development of the free reserves concept.

tary mechanism that the three uses of the term are not distinguished. Thus, when there is an occasional denial or affirmation of the importance of free reserves, it is not made clear which of the three uses of free reserves is involved, and we can only judge from the context. As we shall note, this has encouraged needless confusion about the status of the free reserve conception and its importance in Federal Reserve thinking.

One meaning of free reserves has to do with the causal role assigned to the concept. Previous sections have presented the broad outlines of the causal connection that was said to exist between free reserves and interest rates, or changes in bank credit in the later evolution of Riefler's notions. A second meaning gives to free reserves the function of indicating changes in the prevailing monetary situation, particularly modifications of the Federal Reserve's policy posture. Sustained movements productive of large differences in the level of free reserves usually have been interpreted to indicate more or less "ease" or "restraint" in the monetary system. Closely associated with the signal or indicator function, often assigned to free reserves by Federal Reserve officials, is the third use of the term. This is the target function or the practice of incorporating some particular range of free reserves as a guideline for monetary policy.

The occurrence of free reserves as a policy *target* is heavily dependent on the assumption, implicit in the free reserves conception, that free reserves play a central role in the causal process linking policy actions with the behavior of the credit markets and the money supply. But this conception of the monetary process does not imply the use of free reserves as a policy target. Thus it is quite consistent with the continued adherence to the free reserves conception that other targets may replace free reserves. As we shall see, the choice of an alternative target provides no information that permits us to conclude that the Federal Reserve has rejected the conception of monetary processes centered on the causal role of free reserves. Neither does the use of some other target necessarily indicate that free reserves have been abandoned as a signal of changes in the monetary situation. However, abandonment of the causal connection between free reserves and changes in bank credit would destroy any basis for the indicator or target functions often assigned to free reserves.

Before discussing the use of free reserves as an indicator and/or target of policy actions, it is useful to consider the large variations in free reserves that have occurred since 1946. The table in the appendix* shows that the monthly average of free reserves reached a maximum of \$1.1 billion in January 1946 and dropped to a minimum of minus \$874 million in November 1952. Since 1955 the monthly average has moved between \$500 million and minus \$500 million.

For reasons that have been cited and are inherent in the definition, the Federal Reserve cannot control the volume of free reserves on a daily or weekly basis up to the last dollar. Banks and the public can affect the value of free reserves by borrowing or repaying borrowing, converting demand deposits into time deposits, or depositing and withdrawing currency. These operations cause changes in required or total reserves. Other factors such as float, movements of the Treasury balance between commercial banks and Federal Reserve

*Appendix will appear in full study.

Banks, etc., introduce changes in the volume of free reserves available on any given day. Movements of deposits from Reserve city banks to country banks also change the volume of free reserves since reserve requirements for country banks are lower than for Reserve city banks. As a result of movements of deposits into country banks, fewer reserves are classed as required reserves, more reserves are measured as excess reserves, and free reserves are larger. Movements of deposits in the opposite direction reduce free reserves.

The Federal Reserve is principally concerned with extremely short-run market influences, but it cannot hope to anticipate with precision all of the movements occurring each day or week. It can and does make projections designed to offset some or all of the anticipated changes, as the earlier discussion of "defensive" operations pointed out. But it must be satisfied with a level of free reserves that is subject to daily and weekly variation.

The amount of variation that must be accepted has been reduced in recent years. Better information, improved coordination with the Treasury, and elimination of the higher reserve requirement for central Reserve city banks have all contributed to the reduction in weekly fluctuations. Most of the week-to-week changes in free reserves in 1962 were less than \$50 million. Ten years earlier, week-to-week changes of \$100 or \$200 million were not uncommon.

FREE RESERVES AS A POLICY TARGET

The Federal Open Market Committee at times specifies a range for the value of free reserves. At other times, they may specify some other criterion or a set of criteria. These alternative criteria are often vague, e.g., concepts such as "tone" or "feel," described earlier, may be used. The Manager of the System Open Market Account must then translate these statements into an operative concept, i.e., into a range of free reserves or some other magnitude that he will attempt to maintain. Quite often it is a range of free reserves that is chosen.

The choice of free reserves as the manager's target is very likely to emerge under the circumstances. The account manager's position on the credit market is similar to the position of the commercial banks' money desk men in important respects. Both appraise events in the context of a single bank's frame, and both focus on extremely short-run occurrences. The operational duties imposed on both the account manager and the money desk men channel their views in the direction mentioned, as discussed in "The Federal Reserves' Approach to Policy." Free reserves provide the manager with a concept that is analogous to the "money (or Federal funds) position" that plays a dominant role as a target for the money desk men. Variations in free reserves consistently tend to play a major role in the account manager's considerations. And these same considerations will frequently lead the FOMC to incorporate levels or ranges of free reserves among the policy targets, or will influence the account manager to translate other policy targets into a range of free reserves that he attempts to maintain.

We do not contend that free reserves are the only or most important policy target of the Federal Reserve authorities. As we noted, the acceptance of the free reserve doctrine as a conception about the structure of monetary processes, the choice of free reserves as a specific

signal or indicator of monetary situations, and the choice of free reserves as a policy target are distinct and only partly dependent issues. The dependence of these issues is quite asymmetrical in the sense that rejection of the free reserve doctrine would effectively remove free reserves both as indicator and policy target, whereas acceptance of the doctrine does not entail the other choices, except by a purely nonlogical connection. The use of other policy targets, accompanied by a modified or fading emphasis on free reserve targets, is perfectly compatible with the recognition that free reserves play a causal role in the monetary mechanism and are also used as an indicator of "the degree of ease."

The modification and adjustment of the policy targets, however, poses some problems not fully or explicitly appreciated by the Federal Reserve authorities. A close control over some market rates would preclude a close control over free reserves, unless the discount rate and the reserve requirement ratios are continuously adjusted to evolving circumstances similar to the FOMC's open market operations. But to the extent that requirement ratios and the discount rate are maintained at certain levels, the close control of some interest rates near a target level implies abandonment of free reserves as a closely controlled target. One goal must be sacrificed, in part at least, to the other. For example, in the pre-Accord period, when interest rates were pegged from above to prevent bonds from selling below par, some control of free reserves was lost. Most recently, when bill yields have been pegged from below to prevent a decline in short-term money market rates, some of the control of free reserves has been lost again.

When the Federal Reserve withdraws reserves from the banks through open market operations to maintain a given bill yield, total reserves decline. Some reduction in free reserves will result either because member banks borrow additional reserves to restore some of the reserves removed, or because there is not an equal concomitant reduction in required reserves through a decline in demand deposits or a shift of demand to time deposits. Pegging bill yields is therefore inconsistent with tight control of the level of free reserves.

The pegging of short-term rates in recent years has changed the role of free reserves as a policy target. But that does not mean that they have not remained an important indicator or measure of ease and restraint. An illustration of the effect of choosing bill yields as a guide to policy is contained in a graph accompanying an article by the present Manager of the Open Market Account.²⁵ The graph is entitled "Free Reserves fluctuated from week to week while Short-Term Rates moved narrowly."

The graph shows the effect of choosing bill yields and rejecting free reserves as the primary target of Federal Reserve policy. We have seen that a necessary condition for the choice of free reserves as an indicator and target is the belief that a high level of free reserves induces a rapid rate of credit expansion and that persistently low levels decelerate credit expansion. By choosing the bill yield as policy target, the Federal Reserve surrenders some control of the level of free reserves. The primary instrument becomes the bill yield; the level of free reserves must be adjusted to maintain the bill yield at or near some minimum level.

²⁵ R. W. Stone, "Federal Reserve Open Market Operations in 1962," Federal Reserve Bulletin, April 1963.

The choice of Treasury bill yields as a primary target of System policy is one indication that the goals of System policy have changed. The goal is now related to the so-called balance-of-payments problem. The Federal Reserve has adopted the position that the difference between domestic and foreign (especially European and Canadian) short-term interest rates is an important source of the outflow of gold. To reduce the outflow of gold, domestic short-term interest rates are pegged from below.

It is indicative of the absence of analysis as a base for Federal Reserve policymaking that the choice of the new instrument and the new policy have not been supported by any detailed study that confirms or even strongly suggests that short-term capital movements are highly sensitive to interest rate differentials. This does not mean that the relationship does not exist. Some indirect evidence from general economics supports the relation, but no direct evidence has been adduced thus far that confirms a close and sensitive response of short-term capital to differentials in short-term interest rates. Nevertheless, the new policy and the new target appear to have supplanted free reserves and the goal of achieving ease or restraint; i.e., full employment and price stability.

The adoption of a new policy and a new target does not imply that free reserves have been rejected as a *measure* or indicator of ease and restraint. Rather it suggests that domestic expansion has been relegated to a position of lower priority. In the current and past euphemisms, we have accepted the "discipline of the balance of payments" in place of the policy of "leaning against the wind."

Does the modified free reserve doctrine continue to measure ease and restraint? We suggest that the bulk of the evidence supports the view that it does. The choice of a new target of System policy is important, because it indicates a change in the aims of policy. If domestic expansion will be encouraged by the System only to the extent that the constraints on short-term interest rates permit, then the use of free reserves as a target has been suspended, while the causal role of free reserves is not affected.

This is not the first time in recent years that the System has used an instrument other than free reserves as a target. During the period in which Chairman Martin and others continued to refer to free reserves as an indicator of ease and restraint, other targets were mentioned at times in the "Record of Policy Actions." For example, at the meeting of May 27, 1958, the manager's targets were "to maintain the current posture of monetary ease, without further depressing Treasury bill rates."²⁶ At other times, particularly during Treasury offerings, the manager is told to "maintain an even keel."

Numerous other targets have been used. At the meeting of December 19, 1961, a principal target of short-run policy was the level of "available reserves." This measures the "net change in total reserves after allowing for reserves provided or absorbed to offset seasonal factors and changes in Treasury tax and loan balances at member banks."²⁷ References to total reserves, unborrowed reserves, and a variety of other instruments are found also. At other times, no specific credit market target is mentioned.

²⁶ "Record of Policy Actions," Annual Report of the Board of Governors for the year 1958.

²⁷ Guy Noyes, "Short-Run Objectives of Monetary Policy," Review of Economics and Statistics, Supplement, February 1963, p. 148. Mr. Noyes was Director of the Division of Research and Statistics, Board of Governors at the time.

THE INDICATOR FUNCTION OF FREE RESERVES

Our previous discussion of "defensive operations" and the importance of random elements in the volume of free reserves implies that a single policy target specified in terms of free reserves does not assure even approximate control of free reserves in the shortest run. Moreover, banks do not respond immediately to variations in the volume of free reserves according to the best explications of the free reserve conception. The very short run, or instantaneous, relation between free reserves and "credit expansion" is, therefore, admittedly loose. A longer policy horizon lowers the relative importance of the random components and raises the extent to which the level of free reserves can be controlled. These differences between the Federal Reserve's ability to control the short- and longer-run variations in free reserves are of importance for a discussion of free reserves as an indicator or signal of changing monetary conditions.

Day-to-day variations in free reserves are relatively large. Banks receiving increased reserves may hold them for a day or more, or lend them in the Federal funds market rather than purchase securities or reduce loan rates to stimulate borrowing. That is, banks may interpret the inflow of reserves as "transitory," the result of a "defensive" operation when the Federal Reserve had in mind a "sustained" change in a reserves, a "dynamic" operation or a combination of the two. Similarly, losses of reserves may be treated as "transitory" rather than "sustained" by the banks and thus lead to borrowing in the Federal funds market. For this reason the Federal funds rate and the movements of Federal funds become additional indicators of the effect of policy operations.

Experiments with the reported free reserve totals suggest that a 3-week moving average of total free reserves provides a relatively reliable indicator of Federal Reserve policy. We will consider the evidence in more detail in section 2. It is pointed out here to suggest that there may be a lag of several weeks between a change in the range of free reserves and an evaluation of the change as a sustained change by the market.

Several bankers have indicated to us that their staffs perform similar smoothing operations to obtain a moving average of weekly reported free reserves. Three weeks is often used as the period of the moving average. It is probably not a coincidence that the 3-week moving average permits observers to isolate the periods between meetings of the FOMC. In any case, it suggests that bankers and other interested observers of Federal Reserve policy may not respond immediately to a change in the level of free reserves by increasing or decreasing their outstanding loans and investments. Much may depend on the size of the change in free reserves, the rate on Federal funds, the discount rate, the rate on Treasury bills, and the direction in which these rates move. These and other signs are carefully watched for clues to infer the composition of the changes experienced. Our discussion in a previous chapter indicates that the response of banks to variations in reserve positions substantially depends on their interpretation of these changes. Modifications of reserve positions interpreted as only transitory will not induce the portfolio adjustments typically associated with changes in reserve positions deemed to be persistent and systematic.

From the viewpoint of the banks' money desk men or the Federal Reserve System's account manager the central building block of the free reserve conception—connecting free reserves to "bank credit" expansion—seems most natural and rather obvious. Continuous exposure to the daily variations in reserve positions and the associated portfolio adjustments seems to support the relationship. But the reader is once more cautioned against such impressionistic evidence that contributes little to the discriminating evaluation of accustomed beliefs. Less subjective procedures will be used in section 3 to examine the central core of the free reserves conception and will lead us to reject it. Such rejection immediately invalidates both the causal role and the signal or indicator function attributed to free reserves.

At the present we consider an essentially logical issue, viz, the appropriateness of assigning an indicator character to free reserves *in the context of the free reserve conception*. We are thus not questioning, at the moment, the empirical relevance of this conception. We accept it for the moment and question the signal and indicator function attributed to free reserves by the Federal Reserve authorities.

The logical issue cannot be settled by a direct critical examination of statements made by the Federal Reserve authorities. Their pronouncements are usually too vague to permit a searching analysis without first translating them into a more coherent and definite analytical context. Our appraisal of the compatibility of the indicator character with the free reserve conception is therefore based on a specific translation which we undertook for the examination of this question and related issues.²³ Once more we emphasize that there is no guarantee that our explanation of the Federal Reserve's notion is "correct." It is offered as a substitute for the product never supplied by the Federal Reserve authorities. Its comparative adequacy, however, can be judged by the extent to which typical Federal Reserve statements can be successfully subsumed by our analysis.

The explicit construction of the Federal Reserve's free reserve notions yields a remarkable result. It turns out that free reserves could rationally serve as a signal or indicator in the manner used by the Federal Reserve only if we possess detailed and reliable information about crucial links in the monetary process that are presently beyond our disposal. The required information must be sufficient to separate the strands composing the observable behavior of free reserves. In particular, the component attributable to policy actions should be separated from the influences on free reserves emanating from the economy via the public's asset supply to banks. But in our present situation, i.e., in the absence of sufficiently detailed and reliable information concerning the structure of the monetary process, no useful indicator function can be rationally assigned to free reserves on the basis of the free reserve conception. Indeed, it can be shown that even large variations in free reserves cannot be safely interpreted as modifications of relative "ease" or "tightness" with the usual connotations of accelerated or decelerated rates of "credit expansion." Moreover, even if all the required information were available, other elements (to be explained in section 4) supply a simpler and more useful indicator of the prevailing monetary situation and the Federal Reserve's posture.

²³ Cf. our paper "Evolving . . .," *op. cit.*

Detailed analysis thus exhibits the inadequacy of assigning free reserves an indicator function, even if the central causal role of free reserves is acknowledged. Under these circumstances, how can we explain the attention focused on free reserves by the Federal Reserve authorities? The answer must be found in the piecemeal nature and uncoordinated character of the Federal Reserve's conception. The Federal Reserve apparently never viewed the simultaneous operation and interaction of all the building blocks. Emphasis was placed on the central block, relating market rates, or more recently, the banks' portfolio adjustment with free reserves and the discount rate. The other building blocks were vaguely disregarded.

Attention limited to the single relation emphasizing the causal role of free reserves generated a view of free reserves as a summary measure of the monetary situation. The relevant feedbacks and interactions generated by the other relations constituting the monetary process were neglected, although many of them were a part of the Riefler tradition. The Federal Reserve's procedure may be likened to an explanation of price and output in terms of supply only, disregarding that price and output emerge from the joint interaction of demand and supply forces.

EVIDENCE FROM PUBLISHED STATEMENTS

Our discussion has recognized three separable aspects in the Federal Reserve's view of free reserves, viz: (1) the recognition of their central position in the transmission of monetary impulses, (2) their acceptance as a summary measure of a monetary situation, the signal or indicator function, and (3) their use at times as a target for monetary policy. Two statements made in 1958 provide a relatively clear exposition of the free reserve doctrine as seen by the Federal Reserve.²⁹ The article published by the Federal Reserve Bank of New York appears, on superficial reading, to be a criticism of "the free reserves doctrine." But careful reading yields a different result. A causal role of central importance is explicitly recognized, and a qualified indicator function is acknowledged.

The qualifications that are introduced take the form of explicit recognition that other elements shape the banks' portfolio adjustments jointly with the volume of free reserves. The joint operation of free reserves and other elements at times modifies the interpretation that can be placed on the effect of a particular level of free reserves on the banks' behavior. For example "while excess reserves have been fairly stable, free reserves have moved over a wide range, marking out the major swings between monetary ease and restraint." An important qualification is introduced to explain why a given level of free reserves does not always mean the same thing. Country banks are willing to hold larger excess reserves than money market banks. The accrual of free reserves at money market banks is expected, in general, to have a different effect on portfolio adjustments than a corresponding accrual at country banks.

Other qualifying factors must be considered. "At times when banks have, for example, higher ratios of loans to deposits, or of long-

²⁹ "The Significance and Limitations of Free Reserves," Monthly Review of the Federal Reserve Bank of New York, November 1958; and W. W. Riefler, "Open Market Operations in Long-Term Securities," Federal Reserve Bulletin, November 1958. The former will be referred to as "New York Bank"; the latter as "Riefler." (Italic has been added.)

term to short-term loans (measures of liquidity), they may be *less* responsive to higher levels of free reserves." However, the report notes that the qualifications are not denials of the role of free reserves; they simply indicate that the process of influencing "credit" is not instantaneous. For example, note the following:

"When free reserves are *held for some time* at a relatively high level, member banks will not only continue to make loans available to their customers—and probably *more readily available* than at lower levels of free reserves—but they are also likely to seek out new investment opportunities aggressively * * *." "It is in this way, through the pressure of an enlarged supply of bank funds seeking investment against a reduced demand for bank credit, that there is a tendency for a high level of free reserves to be associated with falling interest rates, increased liquidity in the banking system, expansion of credit, and growth in the money supply."

After a discussion of the effects of a reduction in free reserves the New York Bank adds the following indication that it is the level and not the rate of change of free reserves that influences credit expansion. "(E)asing or restraining effects are related primarily to the *level of free reserves that is being maintained* and are not dependent on continuing further changes in that level. To be sure, as noted above, a given magnitude of free reserves may induce different degrees of ease at different times, depending on a variety of influences. But in maintaining whatever *degree of ease or restraint has been achieved* under the conditions prevailing at any particular time, *it is not necessary for free reserves or net borrowed reserves to rise continuously* to higher and higher levels, as has sometimes been supposed."

On occasion one may encounter passages that seem to deprecate the causal role or the indicator function of free reserves. The New York Bank article refers to the "loose fit of any specific level of free reserves to any degree of credit ease or restraint * * *." We have considered earlier the way in which random variations impose a "loose fit" in the very short run. But the formulation also refers to the modification of the free reserves doctrine mentioned toward the end of the last section. Other elements supplement free reserves as causal factors operating to shape the banks' rate of portfolio adjustment. The report suggests that "consideration must be given to the distribution of bank assets among loans and investments of varying degrees of liquidity, the size and composition of bank liabilities, and the level and structure of interest rates." Other factors may be mentioned on other occasions. A perusal of Federal Reserve pronouncements supplies ample evidence that the range of arguments in the central relation was extended beyond free reserves and discount rate, but the nature of the extension remains ambiguous.

Nevertheless, the conclusion is quite clear. "For all its limitations, the free reserves concept *remains a useful guide* to the interpretation of credit policy." A very similar conclusion with many fewer qualifications is reached in the Riefler article:

"Federal Reserve operations also affect the prices and yields of Government securities *because they change the volume of free reserves available* to member banks." Indeed, Riefler's discussion of Federal Reserve operations provides an indication of their beliefs about the quantitative impact of any change in reserves. "For example, if, as general analysis suggests, something like seven-eighths of the effect

of an open market operation on the availability of funds in the market represents the effect of that operation on bank reserve positions * * * while only one-eighth reflects the fact that bills were simultaneously put into or withdrawn from the market, it follows that a comparable change in the level of net free reserves *from whatever cause* ultimately *should affect the general credit situation and interest rates to roughly the same extent as the open market operation or within seven-eighths of the same extent.*"

The above remarks pertain to the recognition of free reserves both as an indicator of current policy ("marking out the major swings") and as a target of policy ("held for some time," "the level of free reserves that is being maintained"). Riefler also introduces some qualifications about the interpretations of free reserves as a measure of "ease and restraint." To remove doubt that statements published in 1958 are applicable to the interpretation of current policy operations, more recent quotations are provided. These indicate that the free reserve concept has played a major role during the past 5 years.

One very clear set of statements appears as a part of the answers that the Federal Reserve gave to questions asked by the Commission on Money and Credit. Under the heading "Operating Guides and Procedures," we are told:

"The figure of 'free reserves' or its negative counterpart 'net borrowed reserves' provides a convenient and significant working *measure* of the posture of policy at the time. * * * It is also a device that is better adapted than its components taken separately for estimating and projecting the net impact of regular variations in factors affecting reserves.

"The general level of free reserves prevailing over a long period of time may be viewed as an indicator of the degree of restraint or ease that exists in the money market."³⁰ The writer elaborates on some qualifications that must be made. "The particular level of free reserves that may be needed to *achieve the objectives of policy* may vary from time to time depending on changing economic conditions." Recognition is given to the possible changes in required and borrowed reserves.³¹

Further recognition of the causal position of free reserves is given (p. 8) in the statement "The Federal Reserve restrains (or encourages) bank credit expansion by reducing (or increasing) the banks' primary liquidity." The latter term is defined (p. 6) as follows: "Primary bank liquidity relates to the net reserve position of commercial banks." These remarks clearly indicate that the policy of the Federal Reserve is to operate on the level of free reserves in order to effect an increase or decrease in the rate of credit expansion. However, qualifications or modifications are shortly introduced (p. 9).

"The significance at any given time of net borrowed reserves (or free reserves) as a factor tending to restrain (or encourage) bank credit expansion depends on at least five things: (1) the magnitude of free reserves (or net borrowed reserves); (2) the level of short-term money rates relative to Federal Reserve discount rates; (3) the vigor of actual current demands for bank credit; (4) the existing level of total

³⁰ Commission on Money and Credit, "The Federal Reserve and the Treasury. * * *" Op. cit., pp. 19-20. (Italics have been added here and in the following quotations.)

³¹ Op. cit., p. 20. The page numbers in the text that follows refer to the Federal Reserve's answer to the Commission on Money and Credit.

bank liquidity; and (5) the variations among different classes and groups of banks with respect to the conditions just named."

The last quotation, reportedly written by Woodlief Thomas of the staff of the Board of Governors,³² makes quite explicit the role of free reserves as a causal entity of central importance and as a measure or indicator of policy. It should be noted that few of these statements suggest that only free reserves influence the rate of credit expansion. But all of the statements assign an important role to free reserves as a measure of credit policy and as a magnitude to be modified by policy action in order to achieve desired changes in credit markets or the money supply.

Additional testimony to this effect appeared in an article by Young and Yager published in 1960. Their statement assigns a primary role to free reserves and omits many of the qualifications.

" * * * [T]hese mechanical aspects of monetary regulations find their summary in the movement of net reserve positions of the banks. This quantity, in effect, may be thought of as the *rudder* by means of which the monetary ship is made to 'lean against the winds.' * * * Since operations to increase or decrease the System's portfolio are undertaken to change the direction of the rudder... that is to influence the net reserve position of the banking system on the basis of either short- or longer-term considerations or both * * *"³³

The evidence that free reserves have been used as both a measure and, in their causal role, as an instrument of policy is relatively clear. However, one final quotation is introduced to establish (1) that the interpretation of free reserves as an indicator of policy has been suggested within the last several months and (2) that our interpretation of Federal Reserve views is confirmed by statements of their staff.³⁴ In particular they state that increased borrowing by member banks has a contractive effect on the stock of credit or its rate of adjustment.

"One of the most sensitive measures of the day-to-day interaction of monetary policy and market forces is the so-called net reserve position of banks. This measure is computed by subtracting member bank borrowing at the Federal Reserve from excess reserves." A "*persistent change in net reserve positions over a period of several weeks often indicates a basic shift in the credit climate.*"

"In fact such market conditions are likely to stimulate growth in total bank reserves by increasing the willingness of member banks to borrow from the Federal Reserve. However, if a rise in total reserves is composed largely of borrowed reserves, it is less likely to be sustainable than if it is composed mainly of nonborrowed reserves. Member bank borrowing at Federal Reserve Banks is generally regarded as a temporary source of reserves both by the borrowing bank and by the Federal Reserve officials who administer discount operations. This transitory or emergency nature of borrowed reserves, * * * tends to limit the volume of credit that can be supported by such reserves."

These statements, as a group, are sufficiently clear that no summary is required. Our interpretations and some criticisms have already

³² See Guy Noyes, "Short-Run Objective of Monetary Policy," Review of Economics and Statistics' Supplement, February 1963, p. 117.

³³ Ralph A. Young and Charles A. Yager, "The Economics of Bills Preferably," Quarterly Journal of Economics, August 1960, p. 359.

³⁴ "Measures of Member Bank Reserves," Federal Reserve Bulletin, July 1963. The quotations appear on pp. 591 and 593, respectively.

been made in an earlier section. Additional indications of the attachment of the Board of Governors, the Federal Open Market Committee, and their staffs to the free reserves concept are readily available, however.³⁵

Some clues suggesting recent developments of the free reserve conception

Recently, a series of statements with somewhat different import have been made. These statements are somewhat difficult to interpret; they may indicate a change of views in the System, or they may reflect existing dissents or discussions. Some people within the System apparently reject the level of free reserves as an indicator and question the causal role customarily assigned to free reserves. Despite the very recent statement of the Manager of the System Open Market Account describing policy operations in 1962 in terms of the modified free reserves doctrine, there is some evidence that the usefulness of the free reserve concept is not accepted throughout the System.

Clues from published statements

A recent publication of the Federal Reserve Bank of Atlanta asks rhetorically what the Federal Reserve System controls. The answer given is clearly not free reserves but total reserves. It is total reserves that influence the expansion and contraction of "bank credit."³⁶

Lest some doubt remain that the free reserves conception is being reconsidered by some officials, the article discusses excess reserves and borrowings as indicators of policy. It rejects these measures largely for the usual reason that the distribution of excess reserves and borrowing is important. Free reserves are then discussed. The report stresses that "they are greatly overrated as a barometer of credit availability. In fact, focusing on free reserves can be misleading.

* * * Failing as a sure sign of credit availability, free reserves are also faulty as a measure of the intensity of credit demand. Moreover, they are not usually very indicative of actual bank credit trends."³⁷

On other recent occasions, Federal Reserve spokesmen have assigned only the shortest run significance to levels of free reserves, and longer run significance to total reserves. Such statements suggest a modification, but not a rejection, of the free reserves conception. They can be reasonably interpreted in the context of a coherently formulated free reserve conception that explicitly traces the interaction of the relations composing the monetary process. The affirmation of the longer run significance of total reserves does not necessarily reveal a

³⁵ (1) Wm. McC. Martin, "Statements to Congress: Monetary Policy and the Economy," reprinted in Federal Reserve Bulletin, February 1963. See especially p. 124. (2) "Somewhat Less Easy," Monthly Review of the Federal Reserve Bank of San Francisco, p. 113. "Somewhat Less Easy" is equated with a fall in free reserves from \$1 billion to \$170 million. (3) Robert G. Roach, in "Review of the Annual Report for 1961," Joint Economic Committee, Washington, 1961, p. 31. (4) Wm. McC. Martin, *ibid.*, p. 95, pp. 95-97. (5) Robert W. Stone, "Federal Reserve Open Market Operations in 1962," Federal Reserve Bulletin, April 1963, p. 431: "Indicative of the mildness of the shift in emphasis toward less ease in June, weekly average free reserves now often moved in a range of about \$300 million to \$500 million from mid-June to mid-December." * * * "Continuing attention was paid to free reserves, but not to the extent of pursuing particular free reserve levels at the expense of wide swings in the general tone of the money market." Other factors are then mentioned. They are (a) the location of reserves, (b) the availability of Federal funds, (c) dealer financing needs, (d) trends in short-term rates, (e) the pattern of capital market developments, (f) credit expansion, and (g) growth in the money supply. (6) Various meetings of the Federal Open Market Committee reported in "The Record of Policy Actions" in Annual Report of the Board of Governors of the Federal Reserve System. See for examples the report of the meetings on July 11, 1961, Mar. 25, 1956, and Aug. 19, 1953.

³⁶ "What it does come close to controlling are the reserves of banks that are members of the Federal Reserve System. * * * A greater volume of reserves enables banks to expand credit. Thus, the relationship between reserves and bank credit is close, although changes in one are not always accompanied by corresponding changes in the other." Harry Brandt, "Controlling Reserves," Monthly Review of the Federal Reserve Bank of Atlanta, September 1963, p. 1.

³⁷ *Ibid.*, p. 4.

disposition to reject the free reserves conception. More likely it suggests that some of the building blocks described earlier, that had been discarded, are now explicitly considered and acknowledged as relevant.

A more fundamental attack on the free reserves doctrine was mentioned earlier. The statement "use of the term 'excess reserves' to indicate a supply of readily available funds or unused lending power is probably misleading" attacks the root of the free reserves concept as an indicator of potential expansion. It substitutes the view that "a relatively high average level of excess reserves that persists for several months does not necessarily indicate that there is an expansive force on bank credit and money; instead it may reflect a weak credit demand, low interest rates, or an increased desire for liquidity by bankers."³³ The banks' demand for cash assets or reserves is thus introduced as an influence on the rate of expansion of money and credit and interpreted as a response to the prevailing level of interest rates. As suggested above, this position is inconsistent with the analysis based on free reserves and the use of free reserves as an indicator of "ease and restraint."

The admission of a systematic response in the banks' cash asset position to prevailing interest rates is not a minor adjustment of prevailing views. It is a major break with the Riefler-Burgess tradition that assigned a nonvolitional character to banks' indebtedness and later to free reserves. The abandonment of this position is a rejection of the causal role and the indicator function assigned to free reserves by the Federal Reserve authorities. The discovery of bank's demand for free reserves by the Federal Reserve authorities must lead eventually to a fundamental readjustment of the Federal Reserve's conception of the monetary process. Such a readjustment will involve a radical break with an accumulated heritage of views and pronouncements assessing monetary situations and guiding monetary policy.

Clues from answers to questionnaires

These signs of dissension or disagreement within the Federal Reserve System suggested that there may be serious questioning of the causal role and indicator function assigned to free reserves. To obtain more information, a questionnaire was sent to each president of the 12 Reserve Banks and to each member of the Board of Governors. The presidents and the Board members both answered the questionnaire as a group and indicated substantial agreement within each group. Both replies are reproduced in the appendix to this study.

What do their answers indicate? Questions II, V, and VII in effect asked the FOMC members to explain the substantive content of "ease" and "restraint," to describe the monetary mechanism, to specify the role of free reserves in the monetary process and the meaning that they assign to changes in the level of free reserves. Question III asked that the analysis be applied to a particular context, the year 1962. The responses to these questions are extremely helpful in clarifying the state of the Federal Reserve's thinking. Moreover, the answers provide evidence of disagreement between the two groups, since important differences of emphasis appear. These differences suggest the emergence of a "conceptual interregnum." The free reserve doctrine is no longer accepted by all as the primary building

³³ "Excess Reserves," Review, Federal Reserve Bank of St. Louis, April 1963, p. 15.

block in the analysis. The answers provided multiply the signs that the inherited doctrine is being reconsidered. But the answers also reveal quite clearly that the reconsideration has not proceeded far enough to provide a firmer foundation for monetary policy or a more appropriate analysis of the monetary situation. Residues of the free reserve doctrine, emanating from the Riefler-Burgess tradition, continue to hold a prominent place in the Federal Reserve conception.

The 12 presidents indicate that free reserves are one of the indicators but usually not the most important indicator of "credit conditions" even in the very short run. Short-term market interest rates are important in relation to the discount rate (II).³⁹ All of these factors are summarized in the statement that appears to define changes in the degree of ease as "an availability of reserves relative to the economy's demand for credit" (V).

Levels of free reserves above \$500 million have occurred in periods of ease since the "Accord." But the degree of ease is not the same each time the level of free reserves gets above \$500 million because there is no unique association between free reserves of \$500 million or more and a particular level of borrowing, short-term interest rates, or credit expansion (II.4). The demand for reserves must also be considered (II.2 and V.2). In fact it is total reserves, not free reserves, that is "relevant from a longer term point of view" (II.2).

The Board of Governors notes that "ease" and "restraint" are relative terms. They must be interpreted in the light of the demand for reserves by banks. "Interaction between the supply of and demand for free reserves gets reflected in the rate of expansion in total required reserves." The distribution of free reserves is at times an important indicator of short-run behavior of the monetary system (II.1). "The level of free reserves is * * * an *indicator* of the degree of ease or restraint if interpreted in the light of prevailing demand conditions" (II.2; italic in the original). But the most important fact is the demand and supply for loanable funds.

The principal supply factor subject to Federal Reserve policy is said to be the supply of total reserves. This is reflected in the level of free reserves, on the supply side, but must be judged relative to the demand for free reserves. The latter shows primarily changes in the desired borrowing of member banks since the desired excess reserve position of member banks "changes only infrequently" (II.2 and II.1).

Measurement of the demand for free reserves cannot be precise. But the factors influencing the demand are provided "by changes in bank loans, especially business loans, and by the level of interest rates on short-term securities and the Federal funds rate and their relationship to the discount rate." The context suggests that other, unnamed factors might be important also (VII).

The Board appears to place substantially greater influence on the level of free reserves than do the Reserve Bank presidents. Both emphasize a number of other factors, that modify the "free reserves doctrine," but the presidents seem to suggest that free reserves are a relatively poor indicator of short-term policy and that total reserves are better both as a target and as an indicator of policy. Both groups

³⁹ Roman numerals appearing in the text will refer to the numbers of the questions in the appendix, when the answers have been paraphrased or quoted. If a particular subsection is paraphrased or quoted, the reference will be given as II.3. The appendix will appear in the full study to be published later.

seem to agree that if free reserves are used as an indicator of policy, the following must be used to interpret the meaning of the level of free reserves:

- (1) The rate of expansion of bank loans and investments, the rate of expansion of bank loans, or both;
- (2) The Treasury bill rate relative to the rediscount rate;
- (3) The Federal funds rate relative to the rediscount rate;
- (4) The distribution of free reserves, an important factor in the very short run only. To these the presidents would add "tone" or "feel."

There is substantial agreement in the two statements that free reserves are generally not the target of monetary policy. At times free reserves may be used for this purpose. But a variety of other measures and concepts are also used from time to time. This topic will be considered in a later section when we discuss the procedures at the FOMC meetings and the information that is given to the Manager.

Both groups recognize that "ease" and "restraint" are relative matters. Both define these concepts in terms of demand and supply. For the presidents, it is the demand for credit relative to the supply of reserves; for the members of the Board, it is the demand for and supply of loanable funds that determines the prevailing degree of ease and restraint. But this is probably more a difference in wording than in content. The supply of loanable funds is influenced by the supply of reserves. It is in this way that monetary policy is said to operate.

A part of the mechanism underlying and responding to monetary operations is described by both groups. The 12 presidents separate the effects of changes in the supply of reserves from those associated with the demand for reserves by banks, although they suggest that the mechanism is similar in both cases. Central to the discussion of ease is the implicit assumption of a small short-run response by business borrowers to a reduction in interest rates occurring as a result of increases in reserves (V.1). No evidence has been provided to support this contention, but it is assumed to be a basic feature of the process. As a result banks restore and increase their earning assets by buying securities. This reduces interest rates and adds to the stock of money. The 12 presidents seem to recognize that the rate of monetary expansion or contraction may differ from cycle to cycle even if the rate of credit expansion or contraction is the same (V).

The major point of interest that seems to emerge from the discussion is that the stock of credit or its rate of change is the focus of policy. Money is said to respond to an unspecified and complex set of other factors (V. 1). A part of any increase in reserves stemming from open market purchases will be used to advance credit (VII). Indeed this is true of any increase in nonborrowed reserves. Borrowed reserves apparently are not used to support or increase credit according to the 12 presidents.

The Board's reply explicitly lists the ways in which banks will use reserves in periods of ease following periods of restraint. The details differ slightly, and the discussion is less informative, but the conclusions are approximately the same as the presidents' (V). The effect of time deposit rates and rates of interest paid by savings and loan associations are explicitly recognized as important factors that

influence the rate of monetary expansion and the distribution of deposit balances between demand and time deposits.

These statements, when read in detail, seem to suggest that some earlier criticisms of Federal Reserve pronouncements made in this report are not applicable to the present FOMC. Both the presidents and the Board of Governors appear to be aware of the differences in the rates of credit and monetary expansion and even appear to explain the differences in these rates in a manner somewhat similar to the analysis presented in a previous section. Weaknesses in the free reserve concept are more or less implicitly acknowledged and the demand for reserves by banks is introduced as an important influence in the process, difficult to measure, but nonetheless capable of being approximated by reference to observable market entities. Among the important influences affecting the demand for reserves, short-term interest rates relative to the discount rate appear to be prominent. Thus despite the many earlier indications to the contrary, the replies suggest that the Federal Reserve has abandoned, perhaps recently, much of the previous analysis of the monetary process that has been criticized here.

But some disturbing elements remain. Recall that a basic feature of the free reserves concept is the view that borrowing by member banks exerts a restrictive effect on the expansion process and that repayments of borrowing have an expansive effect. This interpretation of borrowing remains as an anachronism. Moreover, the emphasis is still on the rate of credit expansion, not on the rate of monetary expansion. "Monetary policy is concerned with the overall availability of credit." Although it is recognized that credit expansion does not mean the same thing when the rate of monetary expansion is slow as when it is fast, "credit"—not money—is regarded as the factor transmitting System policy to the economy. This means that if credit is expanding at a rapid rate, ease is occurring, *even if the money supply is reduced*. The answers to some specific questions make this clear.

Policy in some specific contexts

The questionnaire asked about some specific policy situations, 1949 and 1961. The answers provide strong evidence that the "credit" view remains dominant. The reformulation of "ease" and "restraint" in terms of the interaction of the demand for and supply of reserves or free reserves has not been systematically absorbed. The analysis that plays a prominent role in response to more general questions is nowhere in evidence when specific questions were answered.

During 1949, a year of recession, the money supply declined. From the end of June 1948 to the end of June 1949, the stock of money decreased by more than \$1 billion. For the calendar year 1949, the decline was smaller, less than one-half billion dollars. During the early months of the recession in 1957, the stock of money fell at the rate of 2.7 percent per annum. In 1961, a year of recovery, the money supply grew at about 2.6 percent per annum. The members of the FOMC were asked to explain these differences in rates of change in question I.6.

The Board of Governors replied that they were following "an active countercyclical monetary policy in both years," i.e., 1949

and 1961. The fact that the stock of money did not increase during the year of recession but did increase in the year of recovery was due apparently to other forces. The 12 presidents stated that "if the Federal Reserve were to attempt to force an increase in the money supply at a faster rate than the public was willing to add to its cash balances at prevailing price levels, the result would be rising prices and aggravation of the balance-of-payments situation rather than promotion of sustainable economic growth."

The Board characterized policy in 1949 and 1961 as "stimulative." This assessment follows if one accepts the inherited notions composing the "free reserve doctrine," described in previous sections. Toward the middle of 1949 free reserves moved from a level of approximately \$600 million to a level of approximately \$800 million. Again in 1961 free reserves would be interpreted to reflect a "stimulative policy." The radical difference in the behavior of the money supply observed during the recession of 1949 and the upswing of 1961 is therefore attributed to the operation of "other factors." "Among the most important of these factors are the economy's demands for bank credit, public preferences for holding liquid assets in particular forms, and the incentives for banks to make loans and purchase investments." But the Board's answer supplies no clues or references to explanations of *how* these other factors operate to affect the money supply. No information is given about the relevance of these "other factors" in the money supply process.

Our own analysis of the two periods, based on a framework summarized in section 4, yields a radically different result. The difference in the behavior of the money stock in the two periods is dominated by the difference in the Federal Reserve's policy behavior. The reader is invited to consult the chart on the growth rate of the extended base in the appendix for a summary measure of policy action. An inspection of the chart indicates that the extended base had a negative growth rate of about -8500 million during most of 1949; in 1961 the growth rate was positive and rapidly accelerating.

Monetary policy was thus strongly stimulative in 1961 and strongly deflationary in 1949. The differential behavior of the money supply thus reflects the difference in the policy pursued by the Federal Reserve authorities. "Other factors" do not explain the deflationary policy pursued in the 1949 recession. Indeed, some relevant "other factors" helped to offset the deflationary consequences of the Federal Reserve's behavior in that year. Foremost among these factors is the public's reallocation of its "payment money" between currency and checking deposits.

The decline in the money supply in 1949 was not the result of "other factors" compensating a properly "stimulative policy." Neither did it reflect the working of a substantial lag between policy actions and the responses of the monetary system. The decline in the money supply reflected the policy pursued by the Federal Reserve authorities. There simply was no "stimulative policy" during the recession of 1949.

The presidents' answer indicates that an increase in the money supply beyond the volume desired by the public would only raise prices and aggravate the balance-of-payments deficit. The last point of course has no bearing for 1949. But the central portion of the presidents' answer appears to deny any effect of increases in the money supply on real output. The effect would be completely ex-

hausted by rising prices. The answer provides, of course, no analysis or evidence supporting the contention that an increase in the money supply during a recession only raises prices without raising real income. To our knowledge no analysis has been performed by the Federal Reserve in order to present a reasonable case for this contention. A mass of contrary evidence suggests the opposite conclusion.

Question III asked the FOMC to interpret some published statements by the present Manager of the System Open Market Account. It was asserted that policy has shifted toward "slightly less ease" in 1962. Our observations indicate that free reserves declined with little noticeable effect on the stock of money and credit or on interest rates. The replies of the Board of Governors and the 12 presidents were similar except for one point. Both agreed that policy contributed to expansion in 1962, that the policy of "slightly less ease" was reflected in money market rates, particularly on Treasury bills and Federal funds, and that it was not clear that "credit" was restricted. The presidents add that they did not intend to restrict credit but *only* to increase interest rates. This appears to deny any effect of increased interest rates on the demand for loans, a position that is inconsistent with their explanation of the operation of monetary policy by inducing changes in interest rates.

What are the facts about interest rates and free reserves in 1962? The monthly averages of daily figures indicate the following for particular months:

TABLE III-1.—Federal funds rates and free reserves for selected months of 1961-62

Month	Federal funds rate in percent	Free reserves in millions
December 1961.....	2.35483	\$419
January 1962.....	2.15322	546
March 1962.....	2.84677	379
June 1962.....	2.68333	391
July 1962.....	2.70967	440
August 1962.....	2.92741	439
November 1962.....	2.94583	473
December 1962.....	2.92741	268

Federal funds rates increased strongly from January to March. Thereafter, they fluctuated in a rather narrow range. When the System allegedly shifted toward "slightly less ease" in mid-June, there is almost no sign of an increase in the Federal funds rate, and there is a rise in free reserves on a month-to-month basis. It was not until August that the Federal funds rate rose above the rate prevailing in March. Thereafter it fell slightly, rose in November, and was the same in December as in August to five decimal places. In late December, when the System again shifted to "slightly less ease," free reserves fell noticeably. But that is the only indication of slightly less ease in the monthly figures.

Treasury bill yields were higher in December than in several previous months. But the peak for the year occurred in July, and yields were lower at the end of the year than in the middle. The same is true in general for 6-month bills, 1-year bills, longer term Government bonds, and municipal bonds. Moreover, the annual rate of change of the money supply was one of the largest for any 6-month period since late 1951, 6 percent in the latter part of 1962 against

minus 0.9 percent in the early part of 1962.⁴⁰ Aside from the change in free reserves in December, it is difficult to find any indication of "slightly less ease" in the information which the Federal Reserve replies referred.

One last answer should be mentioned. Question IV asked both groups to explain what was meant by an "even keel." References to the "even keel" policy are not uncommon in System statements, but we had not been able to find any explanation of what was supposed to remain "even." The presidents replied that maintaining an "even keel" meant that no action would be taken that would alter conditions in the financial markets before, during and shortly after Treasury financing operations. A minor policy shift might be undertaken. The Board of Governors' reply was slightly more explicit. There are no changes in rediscount rates, reserve requirements or reserves, and money market conditions large enough to cause a change in expectations. We interpret this to mean that there are no "dynamic" operations.

The presidents add that free reserves would not be kept constant. Some effort would be made to keep them in a range. But, it is added, free reserves are a highly imperfect indicator of market atmosphere (IV.3). Emphasis is on "reserve availability," in a context that seems to suggest that total reserves, less the reserves required to support Treasury deposits, are taken as the reserve guideline. However, "every market situation is unique" and no general conclusions can be drawn (IV.1).

The Board of Governors do not so clearly deny the relevance of free reserves as a market indicator. Instead, they repeat that constant free reserves are not inconsistent with an unchanged monetary position. This suggests that some operations on free reserves may be attempted.

At first glance it is difficult to reconcile these differing replies to specific questions. How can a single committee have differing interpretations of the meaning of policy? How can a particular measure mean slightly different things to different groups serving on the same committee and making policy decisions? The answer must be that policy directives are made in relatively broad form and that specific meanings have not been assigned or agreed upon. Consideration of the available information on the procedures of the FOMC suggest that this is the case. After a summary of the evidence in this section, we will return to that discussion.

Summary: The modified free reserves doctrine

The evidence from the statements submitted by the members of the FOMAC is subject to a number of interpretations, particularly when read in the light of earlier statements and of applications of their conceptions to particular events. It seems clear that no attempt has been made to write down an explicit statement of the mechanism that relates the actions of the Board of Governors and the FOMC to the stock of money or credit, and to investigate how much can be explained by the particular mechanism. Even if one firmly believes that "judgment" is the most important element in decisionmaking, it does not follow that facts and evidence are useless. Even "judgment" must be shown to be relevant.

⁴⁰ The rates of change of the money supply are reported in the Review, Federal Reserve Bank of St. Louis, August 1963 and October 1961.

Yet there is little or no evidence provided that shows or denies that a particular measure of reserves, perhaps augmented by some measures of interest rates, has a clear and definite relationship to the stock of credit or money or to some other magnitude. Evidence of this kind would seem to be a prerequisite for policy and for the belief that a certain conception is valid as well as the belief that a particular measure of reserves is more useful than certain other measures. Without analysis and detailed evaluation of the evidence, it is extremely difficult to improve understanding of the mechanism connecting monetary policy with the economy.

For these reasons, we attempt to set down in explicit form the mechanism that seems to emerge from the statements quoted. Enough has been said to indicate that there are areas of disagreement within the FOMC, that at times some factors are considered to be more important than others. But unless detailed evidence is used to support these assertions, there is little chance that monetary policy operations can be improved, that the "degree of control" can be increased. Moreover, the statements quoted above generally do not deny that free reserves are an indicator and, at times, a target of policy. Generally, they suggest that free reserves are only one of the elements that must be used. It is for that reason that the conception is referred to here as "the modified free reserves doctrine."

We believe that the free reserves concept is regarded as one of the crucial links in the so-called credit mechanism or the money supply process. To represent the view that a particular level of free reserves does not always bear the same relation to the rate of change of credit, three interest rates are explicitly mentioned as modifying factors. These are the rate on Federal funds, the rate on Treasury bills, and the discount rate. But the references usually suggest that two of these rates, the Treasury bill rate and the Federal funds rate, must be measured relative to the third interest rate, the discount rate. Thus, it is not the absolute yield on Treasury bills or Federal funds that matters; these interest rates must be judged relative to the prevailing discount rate. In the very short run, the distribution of free reserves is said to be of importance also. In addition, some ambiguous fringe elements remain, their position unresolved in Federal Reserve thinking.

The core of the many and often divergent statements of the Federal Reserve may be summarized as follows:

(1) Given the prevailing economic conditions, the demand for and supply of reserves can be expressed in terms of the level and distribution of free reserves, and the two measures of relative yields. These factors are influenced by monetary policy and in fact, dependent, at least in part, directly on policy operations.

(2) The rate of expansion of bank credit is dependent, at least in part, on the way in which monetary policy operations influence the factors affecting the demand for and supply of reserves. The rate of credit expansion is dependent on monetary policy also, but indirectly rather than directly. The intervening relations are the measures used to summarize the demand for and supply of reserves.

(3) Recent pronouncements of the Federal Reserve authorities do not deny or reject the inherited free reserves conception. Instead, they compound the confusion by introducing new notions that contradict the old in important respects. But the older ingredients remain, and the inconsistencies are not resolved.

Among the most fruitful of the "new ideas" is the recognition that bank indebtedness and the prevailing level of excess reserves result from systematic choices made by bankers in response to prevailing market conditions. But the older conception, emphasizing an alternative view of these entities as elements imposed on the banking system, remains. There is no evidence that this conflict has been recognized. If the Federal Reserve attempted to develop a coherent and useful conception, the conflict would become apparent. More important, it is doubtful that the new conception has reached the policymaking bodies.

The dependence of the rate of expansion of bank credit in the short run on the level and distribution of free reserves and relative interest rates does not imply an absence of other influences. There may be changes that arise by chance, e.g., errors in the interpretation of Federal Reserve policy, predominantly local influences that do not balance out nationally, and other random events. Moreover, there may be lags in the effect of some of these factors on the rate of expansion of bank credit or other influences that have not been mentioned in their statements. No amount of private speculation and guessing can substitute for a critical examination of the extent to which the rate of expansion of bank credit or of money has been influenced by the factors summarized above. Only after the attempt has been made to examine the evidence in relation to the presumed mechanism can we intelligently accept, reject, or modify the conception.

The heart of our intended criticism of the Federal Reserve System is that we have found no evidence which suggests that any detailed tests or systematic evaluations have been performed. This has had three important results:

- (1) It has prevented a clear formulation of the relation between monetary policy and the rate of credit expansion that can be used as a guide to future policy operations;
- (2) It has prevented any thorough internal evaluation of the successes and failures of past policy action as a guide to improved understanding of the process and the avoidance of future errors;
- (3) It has given Congress and the public very little real understanding of the power or lack of power of monetary policy as a means of promoting employment and price stability.

Does the modified free reserves doctrine permit the Federal Reserve to predict the rate of expansion of bank credit? Has it worked well in the past? Can it be relied on in the future? How much room must be left for judgment or "feel" in the short run or in the long run? Does it work best in expansion or in contraction? Does monetary policy merely "push on strings" as has been asserted? Is one measure of reserves a better indicator of the impact of policy than another?

Useful answers to these and other questions are not obtained by intuition or by unsupported judgment. Analysis and evidence are required, but before such evidence can be usefully appraised, the conception must be specified clearly. If our interpretation of the Federal Reserve's view of the monetary process is incorrect or deficient, our test of the presumed conception will be inapplicable or irrelevant. If this is the case, we ask only: What is the Federal Reserve's view of the monetary mechanism and where is the analysis and the evidence to support it?

SECTION 2—EVIDENCE FROM ANNOUNCED CHANGES IN POLICY

Another source of information bearing on the use of the doctrine that is centered on free reserves comes from the "Record of Policy Actions" published in the Annual Reports of the Board of Governors. These records contain indications of the policy that was agreed upon at the meeting of the FOMC. If the indicated changes in policy are quickly reflected in the prevailing level of free reserves, this would suggest that free reserves are used as either a target or indicator of policy. If there is no clear relation between changes in the level of free reserves and changes in announced policy, the evidence that free reserves are a target or indicator of policy is weaker.

It might appear that this second source of evidence is redundant. Didn't the previous section conclude that the "modified free reserves doctrine" is a formulation of the conception that is used by the Federal Reserve? While the question is answered in the affirmative, it does not resolve the issue. The statements that we have quoted come mainly from the remarks of the staff and the members of the Board of Governors and the FOMC. It is the Manager of the System Open Market Account who carries out the policy. The evidence in this section is presented to indicate the way in which he interprets the policy decision made at the FOMC meeting. An indication of his interpretations of the policy decision can be observed by comparing movements of free reserves with changes in FOMC policy. A systematic association of policy changes and changes in free reserves would support our contention about the role of free reserves in the Federal Reserve's policy conception.

To evaluate the evidence in this section, it is helpful to understand the relationship between the Manager and the FOMC. Unfortunately, the detailed records of the FOMC meetings are not released, so we must rely on the condensed information that is made available and occasional comments about procedure made in System publications and at congressional hearings. From these we can attempt to assess how much discretion is left to the Manager in the choice of targets and indicators or in the magnitude of open market operations. Before presenting the evidence relating free reserves to the Record of Policy Actions, we discuss the role of the Manager and the control over his operations exercised by the FOMC.

THE FOMC AND THE MANAGER

The Manager is not a member of the FOMC. He has no vote in the policymaking process, but he has an important voice in the deliberations. He briefs the members and other participants about the details of System operations and the factors affecting reserves in advance of each meeting. He provides a detailed weekly summary of operations, and a less detailed daily summary, to each of the presidents and each member of the Board of Governors. He brings the information up to date at each meeting of the FOMC in a written

and verbal statement. He provides and discusses the estimates of the short-run movements of float, Treasury balances, currency, etc., that are deemed to be important between meetings of the FOMC. With the members of the staff of the Board of Governors, who describe the prevailing domestic and international economic climate, he provides the essential background information that is relevant to the decision taken.

Each member of the FOMC and each president, whether currently a member of the Committee or not, has the opportunity to express his views about past policy and desirable future policy. The Manager makes notes for his future guidance. His notes, a statement of consensus, a rather vague directive, and an unofficial set of notes taken by the staff of the Board of Governors are the written guidelines available to the Manager between meetings. By the time of the next meeting, currently at the end of 3 weeks, the notes taken by the staff of the Board of Governors are summarized in a report that is published as a part of the annual Record of Policy Actions. Such records do the Manager little good. He must rely on the more informal documents.

The participants in the discussion offer a rich variety of suggestions and criteria. There is no official format for statements. Even if there is agreement about the direction of policy, there may be disagreement about the method of bringing about greater "ease or restraint" or the size of the desired change. One participant may conclude that greater restraint should occur and may mention an amount or range of amounts by which total reserves should be reduced. Another may clarify his statement by suggesting a range of free reserves, lower than the range prevailing, as an indication of the increased degree of tightness. Still a third may indicate an increase in Treasury bill rates or a level of such rates that would in his judgment represent the desired increase in "restraint." A fourth participant may summarize his position in terms of "tone" or "feel" of the money market.

There are 19 participants at the meeting. There is little or no apparent attempt, at most of the meetings, to summarize the statements of the participants in terms of an objective. (Occasionally, as indicated in the preceding section, a specific target is named, for example, free reserves, bill yields, or total reserves.) Instead, a "directive" is issued or reissued to the Federal Reserve Bank of New York, as the agent for the System, and a statement of consensus is made to summarize the discussion. We consider each of these in turn.

The directive

This formal document has been a curious admixture of detailed restrictions and broad policy goals. In the immediate postwar period and until mid-June 1955, the directive was addressed to an executive committee of the FOMC. The most common form contained an instruction to "provide for the credit needs of commerce and business" or "to relate the supply of funds in the market to the needs of commerce and business." This was the "a" part of paragraph 1. It referred to the seasonal aspects of the problem. The "b" part of the paragraph contained a broad indication of economic or monetary policy. For example, the Executive Committee and later the Federal Reserve Bank of New York would be directed to "maintain orderly markets," "prevent disorderly markets," "avoid deflationary tendencies,"

"avoid deflationary tendencies without encouraging a renewal of inflationary developments," or some similar generality.

In contrast, the remainder of the directive contained very explicit statements. The Executive Committee or the Federal Reserve Bank was told that they could buy or sell in amounts that would change the holdings in the System account by at most a specified number of dollars, that they could only hold a specified dollar amount of Treasury certificates of indebtedness issued directly to the Reserve Banks, that they could exchange directly with the Treasury only a specific amount of securities for gold certificates. During much of the period, agreement was reached that only short-term securities with specific maximum maturity would be used in regular operations, the so-called "bills only" policy.

The "b" clause of paragraph 1 was sufficiently broad that in many years it was possible to change the policy without changing the directive. The converse was also true. At times, the directive would be changed, but it would be noted in the Record of Policy Actions that there was no change in policy. One example of the former type occurred in 1950-52. A new directive was adopted at the meeting of August 18, 1950. Thereafter, in the words of the Committee, the directive issued was "in the same form" as the directive issued at the previous meeting. This phrase reappears from meeting to meeting until late in 1952. Even the famed "Accord" did not require a change in the form of the directive. At times during the period, the Record refers to the need for greater "restraint"; at other meetings, the Committee expresses satisfaction with the degree of "restraint" and states that more restriction is unnecessary; at the meeting of August 18, 1950, strong language was used in the statement accompanying the directive to indicate that the FOMC and the Board "are prepared to use all the means at their command to restrain further expansion of bank credit." At times the policy is described as one of "neutrality." Conversely, the report in 1957 notes that "four changes in the wording of the directive of the Open Market Committee were made during 1957. * * * The January 8 and March 5 changes continued policies * * * in effect * * *"

The most recently published directives, for the year 1962, are somewhat less vague. They provide a more detailed statement of the framework in which the Manager must operate. For example, it was not uncommon in 1962 for the FOMC to add a paragraph indicating how the policy should be implemented. Phrases such as "provide moderate reserve expansion," "avoid downward pressure on interest rates," "foster a moderately firm tone in the money market," or "offset the seasonal easing of Treasury bill rates" have been added to the directive.

One wonders why it is desirable to make very explicit statements about purchases of gold certificates from the Treasury or the use of bills only and very vague statements about the objectives of monetary policy. One wonders, also, why it is possible to indicate a very clear direction at times and no clear direction at other times. For example, the directive of the meeting of December 19, 1961, contained the comparatively explicit statement that the Manager should provide a "somewhat slower rate of increase in total reserves than during the recent months. Operations shall place emphasis on continuance of the 3-month Treasury bill rate at close to the top of the

range recently prevailing. No overt action shall be taken to reduce unduly the supply of reserves or to bring about a rise in interest rates." If the Committee at times can issue a clear statement of the specific intent of policy, why must it be vague at other times?

The consensus

Part of the answer to the question lies in the role of the consensus. At almost every meeting of the FOMC, a statement of consensus, that is not part of the directive, is attached to the Record. This statement summarizes the views of the Committee. After each participant expresses his views, the Chairman indicates the direction of policy—more or less "ease or restraint" or no change in direction. The statement of consensus and accompanying remarks provide a direction for policy until the next meeting. Only on rare occasions does the "consensus" take note of a specific target like reserves or bill yields. More often it takes refuge in vague phrases to indicate the direction of change in policy, if any.

The most obvious reason for the vague directive and the rather broadly stated consensus has already been noted. There is incomplete agreement about the immediate target of monetary policy. This decision is left to the Manager because agreement about a desire for "greater ease or restraint" does not mean that there has been agreement about the exact meaning of the policy. If, as we are told by the 12 presidents (II.1, last paragraph) a variety of indicators are used, it is not unlikely that the Manager is left relatively free to choose the immediate target or measure that seems correct to him. To return to an earlier example, when the various members or participants use total reserves, market interest rates, free reserves, and perhaps "tone" as their indicators of desired policy, it may be impossible for the Manager to satisfy all of them. Meeting the interest rate goal suggested by one participant may increase total or free reserves by more or less than some other member thinks desirable. Under such circumstances, it is difficult for the presidents and Governors to reprimand or criticize the actions taken.¹

Furthermore, the Committee is concerned with day-to-day operations. Errors in float projections, shifts in the Treasury balance, and numerous other short-term changes can and apparently are used to explain deviations from the policy desired by a particular member or members. (For a recent example, see the report of the meeting of January 1962.)

If the Committee cannot or does not agree upon a specific increase or decrease in reserves or some other target, and if it does not agree upon any specific target, it is left for the Manager to decide whether the actions that he takes are appropriate in the light of the general policy statement or consensus. This provides a large measure of autonomy for the Manager that is further encouraged by the reference to numerous and possibly divergent indicators with which participants amplify their statements. It is not uncommon for total reserves and bill yields to move in the same direction for several days. Which criteria does the Manager follow if both have been used by the Committee members as indicators of desired tightness? The choice

¹ A former Manager of long duration reports that he was never asked to explain his action in terms of the specific statements of the Committee and that he was never blamed for failures to carry out instructions. See "Review of the Annual Report * * *," op. cit., pp. 31-32.

must be made by the Manager. If five or six different criteria are used, the discretion left to the Manager is enlarged.

In practice, some devices have been developed to exercise a measure of control over the autonomy of the Manager in carrying out the consensus. Each morning there is a telephone conversation between the trading desk at the New York Bank, the Board of Governors staff in Washington, and one Reserve bank president. The Manager, or one of his principal assistants, outlines the plans for the day. The members or staff of the Board of Governors or the president of some Reserve Bank can question the decision of the Manager and the extent to which it fits within the framework of the directive and the consensus. But the Manager can always point to a large number of market occurrences that indicate to him that the decision is an appropriate interpretation of the sense of the last meeting. If there is no clear, tested conception of the process by which open market operations, interest rates, and other observable market phenomena affect the desired portfolios of banks and the public and no clear statement of FOMC objectives, only unanalyzed judgment can be used to interpret the events that the market is recording and their relation to the FOMC's consensus. Responsible men often differ in their personal judgments. It would be surprising if the views of the Manager, who has the responsibility for the final decision, did not generally prevail.

Other devices used to inform the committee members; e.g., a telegram outlining the telephone discussion for those who did not participate, suffer the same weaknesses. Ultimately, the Chairman or a member of the FOMC must either accept the judgment of the Manager, attempt to modify it, or substitute his judgment for the opinion of the Manager. There is no record of the number of times that such differences have occurred or have been appealed to the Chairman of the Board of Governors, but it would be surprising if the Chairman interfered frequently to reverse or alter the daily decisions of the Manager.

A clear goal for monetary policy has recently been formulated, the maintenance of a particular short-term interest rate. The members of the Committee are consequently in a better position to judge the actions of the Manager. In essence, the Committee has taken a longer run view of policy operations. On the basis of a belief—largely unsupported by detailed examination of direct evidence—that higher short-term interest rates in the United States will reduce the gold outflow, they attempt to maintain a particular interest rate. The administrative effect of this policy is to instruct the Manager that whatever “defensive” operations are taken daily must be tailored to the longer run policy of maintaining the Treasury bill rate. Any member who wishes to judge the actions of the Manager need only look at the bill rate prevailing in the market to see whether or not the primary goal is being achieved.

Very similar procedures could be followed in principle if a particular rate of monetary or credit expansion is taken as the desired goal of monetary policy. But to do so requires an understanding of the precise effect of changes in reserves on the rate of monetary or credit expansion. This requires an explanation of the behavior of the stock of money or credit that usefully predicts future movements with reasonable accuracy. Until there is internal agreement within the FOMC on the relevance and utility of a particular conception of

monetary mechanisms, there can be no agreement about the change in some measure of reserves required to achieve a particular long-range goal. We believe that it is primarily because understanding of the monetary process has not been developed that the FOMC has been concerned with the day-to-day operations in the past and the Manager has developed a large measure of autonomy.

Our understanding that the Manager has exercised substantial autonomy in the past is supported by evidence. The same evidence also suggests that during much of the postwar period, the Manager interpreted the directive and the consensus in terms of a level or range of free reserves. That is, he operated in the market to achieve short- and long-range objectives by altering the level of free reserves. We turn to consider the evidence.

Policy objectives and free reserve levels

Each author of this report independently read relevant portions of the Record of Policy Actions for each meeting of the Federal Open Market Committee from 1946 through 1962. Since the language is often vague, a question of judgment is involved at times as to whether or not there is a minor adjustment of policy. At other times, the signal is quite clear. Using a scale ranging from +1 (decisive easing) to -1 (decisive tightening), we recorded our independent judgments of the meaning of the directive, the consensus, and the accompanying remarks. We then compared these judgments and arrived at our own consensus about the interpretation of the "Record of Policy Actions" for each meeting.² At times, the Record indicated no change in open market policy but referred instead to actions taken by the Board of Governors. These actions—changes in reserve requirements, in discount rates, in preferential buying rates for particular securities—were of importance particularly in the pre-Accord period. Our records place these changes at the time of the open market meeting.

A 3-week moving average of the level of total free reserves was computed. This eliminated some of the extremely short-run fluctuations and permitted a clearer indication of the timing of changes in level. Without reference to our previous dating of changes in the announced policy of the FOMC, we dated the changes in the level (or direction of change) of the 3-week moving average of total free reserves. The two series were then compared to indicate the relation of announced policy changes to changes in free reserves. For the period 1946-51, open market operations were used primarily to control bond prices. The analysis of policy operations for these years will be considered when we discuss the rationale and the results of changes in reserve requirements in a later section.

During the years 1951-62, we recorded 163 meetings of the FOMC including special meetings called for a variety of purposes. At 76 meetings, we recorded a change in policy. All changes are not of the same importance. For example, some of the policy changes are given a scale value of 1/8. This value is used to note a minor modification that is indicated by a statement such as "doubts should be resolved on the side of ease during a period of Treasury financing" or "any deviation should be on the side of less restraint." But at times,

² These judgments differed at times, but they never went in opposite directions. At most, one of us felt that there was no change while the other interpreted the wording to mean a slight change in ease or restraint. By re-reading the report for the relevant meeting, a consensus was reached.

such minor changes are of importance since they may be an initial indication of a reversal of policy.

In keeping with the extremely short-run orientation of the FOMC, most policy decisions are made for the period between meetings. Thus our scaling of the magnitude of policy changes refers only to the change from the previous meeting and cannot be interpreted as an indicator of the absolute level of free reserves. The desired policy holds for a period of 3 weeks under present arrangements. If unexpected events occur, a special meeting may be held, often by telephone, and members of the Committee may decide on a new policy or a new directive. Like the regular meetings, the special meetings generally make decisions that are relative to the prevailing policy and are not absolute. Even when a specific criterion is mentioned, e.g., a particular range of free reserves, the decision must be understood as an agreement that holds only until renewed or modified at the next meeting of the FOMC.

Several questions can be considered using the moving average of free reserves and our scaling or index of policy actions. First, how promptly did the FOMC recognize changes in economic events and respond to them according to the scale that we have developed? Second, how promptly were these actions reflected in the moving average of free reserves? We have already noted that there are more than 70 indicated changes in the direction or magnitude of policy operations. There are a similar number of identified changes in the moving average of free reserves. Many of these are, as noted, minor movements. We will consider, first, the more important movements revealed by the record of Federal Reserve action at or near turning points of economy activity.

The FOMC and free reserves at post-Accord turning points

The National Bureau of Economic Research provides a record of cyclical turning points that shows the month in which the economy is judged to have moved from expansion into contraction, or vice-versa.³ In the post-Accord period, six turning points have been noted. A brief history of the record of Federal Reserve policy decisions and the movement of free reserves is provided for each turning point. To indicate the decision taken, we will present a quotation or summary statement taken from the published Record of Policy Actions for the meeting before, during and/or after the turning point. If the direction of policy did not change at any of these meetings, the date and quotation are given for the first meeting or meetings at which a desired reversal of policy was indicated.

Information is also given for the movement of free reserves during the period. It should be noted that our 3-week moving average is not centered in the middle week. The average for the 3-week period is given the date on which the period ended. This was done to assure that the changes in the level of free reserves would not be reflected in the moving average earlier than they occurred. They may have occurred earlier, and in cases where the exact dating is of some consequence for later discussion, information is also given for the unadjusted weekly level of free reserves.

³ This record, like our index of policy action, is based on judgement. As an alternative, the monthly index of industrial production could be used for this purpose. At times the latter would produce slightly different findings about the speed of response of the FOMC.

1. Peak dated July 1953

Last meeting of the FOMC before the peak, June 11:

Decision: "It was the view of the Committee * * * that policy should be one of aggressively supplying reserves to the market." (Scale of the decision: $\div 1$)

First meeting of the FOMC after the peak, September 24.

Decision: "Further easing would be needed to assure ready availability of credit." (Scale: $\div \frac{1}{2}$)

Movement of free reserves during the period: The moving average had remained between $-\$500$ and $-\$700$ million since February. In the week ending May 27, the moving average rose $\$200$ million. Free reserves continued to rise for several weeks and became positive in the week ending June 10, i.e., *before* the change in policy had been decided upon at the FOMC meeting. From late June until late July, the moving average remained in a narrow range around $+\$500$ million. During August there was a sharp decline, but in the week ending September 23, the moving average of free reserves increased by $\$200$ million to $+\$267$ million. Again the change occurred *before* the FOMC meeting.

2. Trough dated August 1954

Last meeting of the FOMC before the trough, June 23:

Decision: A reduction in reserve requirements was to be partially compensated by open market operations. The net effect was further ease. (Scale: $+\frac{1}{2}$)

First meeting of the FOMC after the trough, September 22:

Decision: "* * * Resolve doubt on the side of ease * * *." (Scale: $+\frac{1}{2}$)

First meeting announcing a clear change in policy, December 7:

Decision: "A reexamination of the policy of 'active ease' * * * led the Committee to the conclusion that the developing economic situation did not warrant continuing as active a program of supplying reserves as had been followed during the preceding year * * *." (Scale: $-\frac{1}{2}$)

Movement of free reserves during the period: The moving average remained between $+\$500$ and $+\$700$ million from March 24 through June 16. In the week ending June 23, the moving average increased to approximately $\$740$ million and remained between $\$650$ and $\$800$ million until the week ending November 24. In the week ending December 1, the moving average declined by $\$250$ million to $\$541$ million. Both of the changes noted in this period occurred *before* the meeting of the FOMC.

3. Peak dated July 1957

Last meeting before the peak, June 18:

Decision: "* * * a firm policy of restraint should be continued for the present * * *." (Scale of the decision: 0)

Two meetings in the peak month, July 9 and 30:

Decision on July 9: "* * * to maintain but not to increase the existing degree of pressure * * *."

Decision, July 30: " * * * To keep the banking system under substantial pressure * * *." (Scale of these decisions: 0)

First meeting after the peak, August 20:

Decision: " * * * the System account would have flexibility in providing reserves * * *." (Scale: $\frac{1}{8}$ (also $\frac{1}{8}$ for meeting September 10)) " * * * doubts would be resolved on the side of less rather than greater restraint."

First meeting announcing a clear change in policy, October 22:

Decision: " * * * although general policy was not to be changed appreciably, it would tend on the easier side from where it had been in recent weeks." (Scale: $+\frac{1}{4}$)

Movement of free reserves during the period: For several months prior to July 24, the moving average of free reserves remained between -\$400 and -\$600 million. In the last week of July and the first week of August, the moving average increased sharply but then returned to the range -\$400 to -\$525 million until the week ending October 16. During the week ending October 23, the moving average of free reserves rose \$180 million to the level -\$321 million. It remained in the range of -\$200 to -\$350 million until December 11; Either the level of free reserves moved in advance of the meeting of October 22, or a sufficient volume of free reserves was supplied on the day following the meeting of the FOMC to raise the 3-week moving average.

No clear indication of the August 20 and September 10 decisions are observable. Two additional indications of an easier policy were made at the meetings of November 12 and December 3. The moving average of free reserves fails to record any significant response to these changes. However, there is a response to the modification of the directive at the meeting of December 17. Free reserves respond in the week ending December 18, gradually moving toward a positive level and ultimately to the range +\$450 to +\$550 million in mid-March 1958.

4. Trough dated April 1958

Last meeting before the trough, March 25:

Decision: " * * * operations in the System account should be directed toward maintaining a slightly larger volume of free reserves and money market conditions slightly easier * * *." (Scale: $+\frac{1}{4}$)

Meeting during the month of the trough, April 15:

Decision: "Easing" was "contemplated" in the form of lower discount rates and reserve requirements. (Scale: $+\frac{1}{4}$)

First meeting after the trough, May 6:

Decision: " * * * the prevailing policy of ease should be continued * * *." (Scale: 0)

First meeting indicating a slight change of policy, May 27:

Decision: " * * * maintain the current posture of monetary policy without further depressing Treasury bill rates * * *." (Scale: $-\frac{1}{8}$)

First recognition of a major change in policy direction, August 19 (on July 29 a smaller policy change was indicated also):

Decision, July 29: "Absorb redundant reserves generated by emergency purchases of securities." (Scale: $-\frac{1}{4}$)

Decision, August 19: "that the rate of expansion in the money supply * * * should be tempered and that operations for the System Open Market Account should move in the direction of lower free reserves * * *." (Scale: $-\frac{1}{2}$)

Movement of free reserves during the period: The level \$450 to \$550 million that had been reached in mid-March was retained throughout the spring. Neither the moving average nor the unadjusted weekly data show any significant effect of the decisions taken at the meetings on March 25 and April 15. The meeting of July 8 indicated no change in policy, but free reserves moved up slightly in the week ending July 9, perhaps for seasonal or holiday reasons. The range of \$540 to \$600 million was maintained until the week ending August 6. The decision taken at a special meeting on July 18, to ease the money market in response to the "disorderly conditions," has very little effect on the moving average.

The first sign of change toward a policy of increased restraint appears in the moving average of free reserves in the week ending August 13. Once again this change *precedes* the decision to restrict the rate of growth of the money supply that was made at the meeting of August 19.

Between the week ending August 13 and the week ending September 17, the moving average declined steadily to a range between \$50 and \$125 million. No further indications of policy change or increased restraint are noted at the FOMC meetings until December 2 and December 16 when a desire for further tightening is recorded. As if in anticipation of these decisions, the level of free reserves began to fall in the week ending November 26, became negative in the week ending December 3, and remained in the range 0 to $-\$100$ million until mid-March 1959.

5. Peak dated May 1960

Last meeting before peak, April 12:

Decision: "* * * the consensus favored easing further the reserve position of member banks * * *." (Scale: $+\frac{1}{2}$)

Meetings during the month of the peak, May 3 and 24:

Decisions taken: (May 3) "* * * moving moderately in the direction of increasing the supply of reserves available to the banking system" (scale: $\frac{1}{4}$). (May 24) "The consensus favored * * * a further supply of reserves * * *" (scale: $+\frac{1}{2}$).

First meeting after the peak, June 14:

Decision: "* * * any deviation should be on the side of case * * *." (Scale: $+\frac{1}{8}$)

First recognition of a major change in policy direction, March 1 (taken in advance of the peak):

Decision: "The Committee concluded that it would be appropriate to supply reserves to the banking system somewhat more readily." This was characterized as a policy of "moderately less restraint." (Scale: $+\frac{1}{2}$)

Movement of free reserves during the period: In early June 1959, the moving average of free reserves fell below $-\$370$ million and remained below that level, with the exception of 2 weeks in late January, until the week ending March 2, 1960. During most of this period, average free reserves were below $-\$450$ million. Concurrent with or in advance of, the meeting of the FOMC on March 1, the moving average rose until it reached the range $-\$100$ to $-\$225$ million where it remained from March 23 to May 17. The decision to ease further taken at the meeting of April 12 has no perceptible influence on the moving average. During the weeks ending April 6, 13, and 20, free reserves are near the top of the range indicated. There is some slight increase in the following 2 weeks and a further increase following the meeting on May 3. In advance of the decision on May 24, free reserves rose during the week ending on that date and remained between 0 and $+\$200$ million during most of the summer.

6. Trough dated February 1961

Last meeting before the trough, January 24:

Decision: "* * * there should be no change in the existing degree of monetary ease * * *." Close attention to the bill rate was urged for balance-of-payments reasons. (Scale: $-\frac{1}{2}$)

Meeting during month of the trough, February 7:

Decision: "The consensus of the Committee favored no change in open market policy * * *." (Scale: 0)

First meeting after the trough, March 7:

Decision: "The consensus of the Committee was that the existing monetary policy of ease should be followed * * *." (Scale: 0)

First post-trough decision for a minor policy change, August 22:

Decision: The consensus favored continuing the policy of early August "when a confluence of market factors contrived to produce more firmness than had otherwise been the case." (Scale: $-\frac{1}{2}$)

First post-trough decision for a significant change in policy, December 19:

Decision: "* * * no substantial change from recent policies was called for. * * * a somewhat slower rate of increase in total reserves than during recent months * * *." (Scale: $-\frac{1}{2}$)

Movement of free reserves during the period: In December 1960 and January 1961, the moving average remained in the range $+\$650$ to $+\$750$ million. During the first week of February, the average

fell \$125 million to \$609 million, most likely reversing a seasonal increment in reserves during the late fall. Thereafter, the average remained between \$450 and \$600 million throughout the year 1961 with very minor exceptions. There is no indication of a move toward lower free reserves following the meeting of August 22. Indeed free reserves rose in the week ending August 23, by \$63 million from the lower level that had prevailed in advance of the meeting. The lower level of early August was not regained until October.

The desired increase in tightness indicated by the decision made in late December is reflected in the average free reserves for the week ending January 3, 1962. Thereafter free reserves returned to the approximate range in which they had been, \$450 to \$600 million. However, free reserves are generally high or rising in January as currency flows back to the banks. The failure of the average to rise may be an indication of the move to a tighter policy.

The record at turning points in economic activity is summarized in table IV-1.

TABLE IV-1.—A summary of policy actions and movements of free reserves at post-Accord turning points

Date of turning point (NBER) (month)	1st indication of—		Change in the moving average of free re- serves (week ending)
	Any change in the direction of policy (day)	Major change in policy (day)	
July 1953.....	June 11.....	June 11.....	May 27.
August 1954.....	Dec. 7.....	Dec. 7.....	Dec. 1.
July 1957.....	Aug. 20.....	Oct. 22.....	Oct. 23.
April 1958.....	May 27.....	Aug. 19.....	Aug. 13.
May 1960.....	Feb. 9.....	Mar. 1.....	Mar. 2.
February 1961.....	Jan. 24, 1961, or Aug. 22.	Dec. 19.....	Jan. 3, 1962.

Before commenting upon some important issues and questions that arise from this discussion, we will present some additional evidence of the relation of free reserves to the desired policy changes published in the Record of Policy Actions.

The FOMC and free reserves in 1962-63

Our earlier discussion of the targets and indicators of Federal Reserve policy suggested that policy actions in 1962 were reflected in the movement of free reserves despite the attention paid to the level of Treasury bill yields as a target of policy action. A careful reading of the Record of Policy Actions and the changes in the moving average of free reserves for the year largely confirms our earlier statement. Moreover, it provides additional indication of the importance of the level of free reserves in the management of the System Open Market Account.

Our index of policy indicates one minor and three more important changes in desired policy recorded in the reports of the meetings of the FOMC. These changes are shown in table IV-2. All other meetings of the FOMC produced no change in desired policy and are scaled 0.⁴

⁴ The meeting of Oct. 23 indicates seasonal easing to be accomplished by a reduction in time deposit reserve requirements by the Board.

TABLE IV-2.—*Scaling of the Policy Record for 1962*

Date of meeting	Magnitude of desired change	Quotation or paraphrase of the Record
Mar. 6.....	+ $\frac{1}{8}$	The majority favored no change, but "promote further expansion of bank credit."
Mar. 27.....	+ $\frac{1}{4}$	Slightly more expansion in reserve availability than had developed.
June 19.....	- $\frac{1}{4}$	"Avoid redundant reserves." "Slightly less easy policy indicated."
Dec. 18.....	- $\frac{1}{4}$	A somewhat less easy policy was favored by the majority to firm Treasury bill rates.

The moving average of free reserves remained in a very narrow range during most of the year. Certain changes in level are discernible however and are recorded in table IV-3.

TABLE IV-3.—*Free reserve ranges during 1962 and early 1963*

Date(s)	Range of the level of free reserves (millions)
Week ending—	
Feb. 7.....	\$504
Feb. 14 to Mar. 14.....	\$425 to \$450
Mar. 21 to May 16.....	\$375 to \$425
May 23 to June 13.....	\$440 to \$490
June 20 to July 4.....	\$360 to \$390
July 11 to Dec. 5.....	\$400 to \$450
Dec. 12 to Jan. 30, 1963.....	\$300 to \$375
Feb. 6, 1963 to March 1963.....	\$280 to \$315

The data in the two tables suggest that the level of free reserve was not reduced in response to either indication by the Committee of a slight desire to ease. Instead, a movement toward a lower free reserve level occurred between the two decisions to ease. However, both desired changes toward tighter money markets are reflected in the level of free reserves in advance of the meeting of the FOMC at which the decision was made. The change in June was reversed partially in July, and the moving average of free reserves remained in very narrow bounds during the next 5 months.

The Record of Policy Actions for 1963 is not yet available. Nevertheless, for the first months, the moving average of free reserves suggests that a movement toward increased restraint occurred in early February. Perusal of the unadjusted data suggests that an additional desired policy change toward increased restraint was made about the middle of May.

APPRAISAL OF THE POST-ACCORD RECORD OF POLICY ACTIONS

Three principal conclusions about the record of FOMC actions during the post-Accord period emerge from the data. A discussion of each of these permits additional appraisal of the policymaking procedures of the FOMC and the Federal Reserve's understanding of the monetary mechanism. We will consider in turn (1) the timing of decisions at turning points or speed of response of the FOMC, (2) the autonomy of the Manager, and (3) the meaning of the findings for the role of free reserves in the Federal Reserve's view of the monetary mechanism.

The timing of policy changes

The FOMC's record at post-Accord turning points, summarized in table IV-1, is most impressive. Much of the academic criticism of the Federal Reserve has suggested that the FOMC or the Board is slow to respond to changes in economic indicators. Our appraisal of the evidence suggests the opposite. In particular, when economic activity has reached a peak and discretionary policy should move toward "ease," the FOMC has been quick to recognize the need for a change in policy. Indeed, our index or scaling of the Record of Policy Actions suggests that the Federal Reserve indicated a desire to reverse the direction of policy in advance of the peak recorded by the National Bureau at two of the three postwar peaks.

We submit that this record is remarkably good. It should be recalled that the turning points recorded by the National Bureau are chosen with hindsight. But the desired direction of monetary policy must be made by considering the detail of present and past events and by attempting to assess the near-term future. The record at peaks suggests an extremely competent assessment of economic data by the staff and the use of excellent judgment by the Committee.

Some writers have presented an alternative interpretation of a part of this record. It has been suggested that the reversal of policy in 1953 was accidental, a response to the "disorderly conditions" that had developed in the bond market. We do not believe that detailed examination of the record supports this conclusion. First, the level of free reserves began to increase before the development of disorderly markets in June. The unadjusted weekly data for free reserves record an increase in the level of free reserves of more than \$400 million in the week ending May 20. The moving average of free reserves places the change in policy a week later. In any case, the change was initiated before there was any indication of difficulty with the newly issued 3¼-percent bonds. Second, the increase in the moving average of free reserves during the "disorderly period" was reversed, while the earlier change was not. In early August, the moving average of free reserves returned to the range in which it had been in early June and remained between - \$100 and + \$100 million in every week from August 5 to September 16. Thereafter, free reserves increased perhaps in anticipation of the decision by the FOMC at the meeting on September 24. Third, the response to the disorderly markets in July 1958 proceeded in a rather similar way. In 1953, the unadjusted data show that almost \$750 million of additional free reserves was supplied during the 2-week period June 10 to 24. The newly created reserves were withdrawn by early August as noted above. In July 1958, the System was maintaining a policy described as "ease" and had not yet indicated a desire for any significant increase in "restraint." Nevertheless, the unadjusted weekly data show that only \$250 million was supplied temporarily and withdrawn within 2 weeks. The System acted with greater restraint, and reversed more quickly in 1958, but, in both "disorderly markets," the previously existing level of free reserves was restored. Later additional policy actions were taken. It is difficult to understand why a temporary increase in reserves should ease the banking system in one case but not in the other. But that conclusion seems implicit in the argument of those who regard the prompt response by the FOMC to the developing recession in

1953 as a fortunate accident. Finally, the FOMC showed again in 1960 that it was capable of recognizing a deceleration in the pace of economic activity before the cyclical peak was reached.

Table IV-1 also suggests that the lag between the trough and the indicated desire to tighten is longer than the lag between the peak and the indicated desire to ease. More importantly, the table suggests that these lags are comparatively short. The latter conclusion is directly opposed to the finding of Brown, Solow, Ando, and Kareken, in a study prepared for the Commission on Money and Credit.⁵ The difference between the findings here and findings of Brown et al. arises from a difference in measurement procedure associated with different conceptions about the monetary process. Our procedure is related to the dominant notion guiding the Federal Reserve's evaluations and policy actions. Brown et al. select some maximally achievable stock of bank credit as an index of modifications in monetary policy. The lag in the appropriate motion of this index behind cyclical turning points is then interpreted to measure the Federal Reserve's "recognition lag," its habitual lag in recognizing changing economic circumstances. But the lag measured by Brown et al. permits an alternative interpretation which denies the significant occurrence of a recognition lag, at least for the peak. We have already submitted evidence indicating a recognition lag not longer than the period required for purely "technological" reasons to collect and prepare the necessary information. This period is substantially shorter than the lag estimated by Brown et al. We do not question the existence or the relevance of the lag obtained by Brown et al., but we do contend that it is not attributable to a lag in recognition. The lag observed by Brown et al. is the natural outcome of policy actions based on a misconception about the structure of the monetary process. In case of an onsetting recession the Federal Reserve observes the rapid upsurge of free reserves and feels that it has pursued a "stimulative policy." It has rapidly become aware of the change in circumstances and adjusted the prevailing policy posture according to its own conceptions. But guidance based on the free reserve doctrine frequently leads the Federal Reserve authorities into a position where they believe that a countercyclical monetary policy is underway, while for many months almost no relevant action is taken. Consider, for example, open market purchases intended by the Federal Reserve to "ease reserve positions" and thus exert an expansionary effect. Suppose that the injected reserve funds are used to repay borrowings. Total reserves are therefore unchanged, and Brown et al. would indicate no change in Federal Reserve policy, although the FOMC, judging policy actions in terms of the modified free reserve doctrine, would believe that it had moved toward "ease." While we have indicated that the modified free reserve doctrine is a defective tool, we have suggested quite strongly that it is the doctrine that the FOMC uses. However correct or incorrect the views propounded by Brown et al., one cannot measure the lag in recognition according to a theory which does not guide actual policymaking. For this reason, the measurement of the lag between turning points and Federal Reserve recognition and action should not be measured by the rate of change of maximum

⁵ E. Cary Brown, R. M. Solow, A. Ando, and J. Kareken, "Lags in Fiscal and Monetary Policy," prepared for the Commission on Money and Credit.

bank credit. The findings of Brown et al. simply indicate again one of the problems with the free reserve (or modified free reserve) doctrine.⁶

The fact that the lag in changing policy at troughs is longer than the lag at peaks does not necessarily indicate a slower recognition of recoveries. It is doubtful that more rapid movement toward "restraint" would be desirable from the viewpoint of either the FOMC or the economy. There is always the danger that a more rapid reversal of policy at the trough—"tightening" faster—would smother the incipient recovery. Since the FOMC and the staffs of the Federal Reserve have not attempted to appraise carefully the relation of monetary policy to the stock of money and the pace of economic activity, they have no information about the length of the lag between their decisions and their effects on money and national income. Still, it would appear to the outside observer that the Federal Reserve authorities assume the lag to be very short. This assumption is at least consistent with the quick reversals in policy direction which may be observed on occasion. The Record of Policy Action for the period 1955-57 is most instructive in this respect.

Several reversals of policy were made during that period since the judgment of the FOMC indicated that the economy may have reversed direction. The year 1956 is particularly interesting in this regard. There were 10 major changes or minor adjustments in policy at the 18 meetings held. Only a few of these changes are considered here to indicate the frequency of some major policy revisions that the FOMC desired to institute.

January 24: "a shift in emphasis seemed desirable" "some relaxation of restraint appropriate in the near future" (Scale: +½)

March 27: "The supplementary clause which was introduced in January 24, was eliminated" "instructions to take into account deflationary tendencies * * * was not consistent with the existing situation." (Scale: -½)

May 23: "the Committee agreed that during the immediate future additional reserves should be supplied to take care * * * of growth needs." The qualifying phrase deleted from the instructions in March 27 was reintroduced. (Scale: +½)

August 7: The qualifying phrase reintroduced on May 23 was deleted. Instructions required that attention be directed toward inflationary developments. (Scale: -½)

In the space of 8 months the desired direction of policy changed at least four times. For the many reversals of policy in 1956 to have an important bearing on the pace of activity three conditions must be satisfied: (1) the Federal Reserve's control mechanism must operate with very short lags; (2) the money supply must respond rapidly to changes in the level of free reserves and (3) the pace of economic activity must respond very quickly to changes in the stock of money.

⁶ Brown et al. recognize in their appendix the problem raised here. They dismiss free reserves for a reason analogous to the one mentioned in the text. This seems to miss the point. The lag between recognition and action may be very short. But if the theory or doctrine used by the FOMC has little relation to the rate of change of the stock of credit or money or to the maximum stock of bank credit, criticism should be directed toward the theory and not toward the length of time that the FOMC takes to recognize changes in the pace of economic activity or turning points.

For further evidence of the problem raised by inappropriate judgment of its actions by the FOMC, see our discussion in "The Federal Reserve's Approach to Policy," of the differences in average monthly changes in money and "credit" during economic expansion and contraction.

But if the control mechanism operates only slowly on the level of economic activity, these frequent reversals in the direction of policy have no justification. The inclination to reverse policy direction easily and rapidly is likely to generate uncertainty and raise interest rates comparatively.

When the turning point did occur in the summer of 1957, the Federal Reserve moved more slowly than it had at the start of the earlier or later postwar recession. There was recognition that the economy had been "moving sidewise" for several months, but more than 3 months passed before there was a major change in desired policy. It is not unlikely that the experience of 1956, and the judgment by members of the Committee that their response to the events of 1956 had contributed to "inflationary pressures" in 1957, delayed action at this turning point. The record indicates that one member of the Board of Governors opposed all movements toward ease at FOMC meetings until December and opposed a reduction in the discount rate in November because of his fear of "inflation."

The lesson from this experience seems to be that the FOMC has had a good—and perhaps excellent—record in judging the timing of post-Accord turning points. Whether or not its judgments between turning points have been appropriate depends on the relevance of the modified free reserves doctrine. This is not solely a judgmental matter; it is one that requires detailed appraisal of evidence. Some information on that question will be presented shortly. We will reopen the question at that point.

The autonomy of the Manager

The timing of the responses of free reserves shown in table IV-1, and the discussion in the text about the movement of free reserves at or near cyclical turning points, suggested quite strongly that the free reserve levels often change in advance of meetings of the FOMC. Additional evidence often pointing in the same direction is provided at times of other policy changes or modifications. Some of the policy actions in 1956 have been indicated in the preceding section. Changes in free reserve levels around these dates are considered here, using the 3-week moving average to date changes in level:

1. The decision of January 24: The moving average remained in the range —\$350 to —\$500 million in the fall of 1955. It rose to —\$192 million in the week ending December 28 and to —\$50 million in the first 2 weeks of January. Following the FOMC meeting indicating a desire for further ease, the free reserve level began to decline. If there was any movement toward ease, it appears in advance of the meeting, not after, if judged by the moving average of free reserves.

2. The decision of March 27: A decision was made to tighten. The moving average indicates a reduction of \$140 million from the level prevailing in the previous 2 weeks. This reduction came in the week ending March 28 and returned free reserves to the level existing in mid-December. Again the Manager appears to have moved in advance of the FOMC decision.

3. The decision of May 23: A movement toward greater ease was indicated at the meeting. The moving average had remained between —\$450 and —\$600 million from late March until the time of the meeting. Free reserves increased slightly

in the week of the meeting, but did not leave the prevailing range until the week ending June 6, when they rose to —\$364 million. Thereafter they continued to rise for several weeks until they attained the range —\$100 to —\$200 million where they remained until early August. This policy change is not reflected in the moving average until after the meeting of the FOMC.

4. The decision of August 7: The FOMC instructed the Manager to increase restraint. The moving average responded rather promptly, but again the response came after the meeting. In the week ending August 8, there is a slight fall in the level, but free reserves remain in the previous range. In the following week, ending August 15, the moving average fell \$125 million. We interpret this response as one that occurred after the meeting, although it could be an advance indication of the decision taken at the meeting on August 21 that called for additional restraint.

At two of the four meetings in 1956, at five of the six turning points shown in table IV-1, as well as at other times, the moving average of free reserves appears to have changed direction in advance of the decision by the FOMC. Moreover, the close correspondence between changes in the moving average of free reserves and the decisions of the FOMC is unlikely to reflect the operation of chance factors or solely the behavior of the banks and the public. Instead the relation between decisions of the FOMC and the changes in the moving average suggest that free reserves are an important part of the control mechanism used by the Federal Reserve.

Most important, the evidence suggests that the Manager has much wider latitude for policy operations than has generally been conceded. We have noted that he is largely responsible for the day-to-day operations that are an important part of open market operations. And we have seen that an important analyst of System operations, R. V. Roosa, has concluded that the "dynamic" or policy operations "emerge from the day's confusion as a dominating force."⁷ But only by examining the evidence of the relation of FOMC decisions to the movement of free reserves has it been possible to observe that the FOMC often ratifies a decision that has already been made rather than directing policy operations.

If there is no clear guide to policy operations and no clear understanding of the relation of policy operations to the rate of change of the stock of money and credit, it becomes extremely difficult for members of the Committee to make independent judgments about the state of the market or to interpret the prevailing policy. While our evidence does not indicate that the Manager is making the policy decisions, it does suggest that frequently someone or some group other than the full Committee is making policy decisions that Congress has entrusted to the Federal Open Market Committee.

Free reserves as an indicator of desired ease and restraint

The evidence on the relation of policy decisions to changes in the moving average of free reserves bears out the conclusions of the lengthy discussion on the Federal Reserve view of the monetary mechanism. We contended that there is no single, unified, consistent view that can be characterized as the Federal Reserve view. But we noted also that many of the statements made are consistent with

⁷ Roosa, *op. cit.*, p. 105.

our interpretation that free reserves are regarded by the Federal Reserve as a major element in the monetary mechanism.

Consideration of the details of policy operations in this section provide strong confirmation of the importance of free reserves in the Federal Reserve's policy operations. Although there may be many different and changing interpretations of the usefulness of particular indicators within the FOMC, there is a single Manager. We have now found that there is a strong indication that his actions are more than a reflection of the policy views of the Committee. Often the reverse is true; the Manager permits or encourages changes in the level of free reserves, and the Committee often ratifies his prior decision.

However useful it may be for the Committee to change the guides to desired policy or to refer to a variety of targets and indicators in their discussion, it is extremely difficult for the Manager to continually readjust his operations to a new target or indicator every few weeks. Market events do not have the same interpretation in terms of all of the criteria that are proposed. In self-defense the Manager must choose and retain a particular criterion or set of criteria by which he can judge the effect of his operations. He then translates the vague and often changing suggestions of the Committee into the framework that is useful to him in his operations. Moreover, it is the Manager who furnishes the principal information on the "tone" of the money market to the Committee. It is not difficult to understand, therefore, why the Committee is often in the position in which it can do little more than ratify his prior judgments. Since the FOMC as a group does not have any explicit criteria or analytic frame for independent judgment, it is not clear that they are aware of the autonomy exercised by the Manager.⁸

Thus it occurs that the Manager is relatively free to make adjustments in policy in advance of the FOMC meetings or to avoid adjustments judged to be desirable by the Committee. Since both Managers have testified about the importance of free reserves in their view of the mechanism, little doubt remains about the importance of free reserves in the actual operations of the System.⁹

Summary

We have found that the moving average of free reserves is often an adequate guide to System policy and that movements in the level of free reserves are often made in anticipation of decisions of the FOMC.¹⁰ But at other times, we have found that changes in desired policy are not noticeably reflected in the level of free reserves. Small changes in emphasis; e.g., modifications characterized by the statement "resolve doubts on the side of ease," are rarely observable in the moving average. We must conclude that either (1) these small

⁸ The procedures described do help to explain why the Committee does not "blame the Manager for mistakes or alter his judgment about the state of the market." See the testimony of the former Manager on this point in "Review of the Annual Report * * *," *op. cit.*, pp. 31-32.

⁹ See the statement by Robert Rouse, *ibid.*, p. 34, discussing the relation of free reserves to the rate of change of bank credit and suggesting the importance of free reserves in his understanding of the monetary mechanism. See also the statement of Robert Stone, "Federal Reserve Open Market Operations in 1962," *op. cit.* As we have indicated above, Stone's discussion of policy changes is largely in terms of the free reserve concept.

¹⁰ We have found only one writer who has noted that the level of free reserves often moves in advance of policy decisions. Cf. Daniel S. Ahearn, "Federal Reserve Policy Reappraised" (New York: Columbia University Press, 1963), p. 218-n.6. It is not clear from Ahearn's discussion whether he is referring to discount policy only or to open market policy as well. In any case, he offers very little evidence in support of his finding.

changes are eliminated along with many other random variations when the moving average is constructed, (2) that free reserves are not used to effect these small changes; e.g., only the distribution of reserves is affected, or (3) that the Manager ignores some of the instructions given by the Committee. In view of large week-to-week changes in unadjusted free reserves and the relatively wide range of values for the moving average that characterizes a particular policy, it is likely that the first or second interpretation is correct.

More troublesome for our interpretation is the absence of changes in the level of free reserves when somewhat larger changes in policy are directed. For example, we noted that the level of free reserves shows little change toward ease either before or after the meetings of March 25 and April 15, 1958, or March 27, 1962. Our index gives each of these statements a value of $\frac{1}{4}$. On the basis of our analysis, we cannot reach a firm conclusion about these counter-examples.

Nevertheless, the detailed examination of System policy seems to indicate that the timing of many of the major changes in monetary policy actions in the post-Accord period can be observed using the moving average of free reserves. Moreover, the evidence suggests that the FOMC moves rather quickly at times of change in the direction of economic activity. In current academic parlance, the "inside lag" in monetary policy appears to be extremely short. On two of the three occasions when the economy turned toward recession, the "recognition lag" was negative; when the economy turned toward recovery, the "recognition lag" was longer, averaging 3 to 4 months. But this longer lag is most likely a reflection of the desire on the part of the FOMC to avoid stifling an incipient recovery. The "action lag"—the length of time that it takes for decisions to be carried out—is at most zero and often negative, if we choose the moving average of free reserves as the measure of System policy. We conclude, therefore, that the System's post-Accord record of recognizing and acting at turning points can only be regarded as splendid.

The size of the response by the System and the speed with which the change in free reserves affects the rate of change in money and credit have not yet been considered. Recognition and action at turning points are undoubtedly important. But it is also important to take action in terms of the best available instruments that an understanding of the monetary mechanism can provide. We turn, therefore, to consider the relation of free reserves and the "modified free reserves mechanism" to the rate of change of money and credit.

SECTION 3—THE RELATION OF FREE RESERVES TO CHANGES IN MONEY AND CREDIT

Analysis of the effectiveness of monetary policy can be divided into three subtopics: (1) The timing of the recognition of the need for policy changes and the decision to act; (2) the choice of appropriate action to influence promptly the stock of money and credit; and (3) the effect of changes in money and credit on the pace of economic activity. We have seen that the post-Accord decisions of the FOMC have been timed commendably and that action has often been taken by the manager in advance of the Committee's decision to act. But effective monetary policy depends also on the extent to which the action taken by the Federal Reserve is capable of altering the stock of money in the appropriate direction. This in turn depends on an understanding of the mechanism relating policy actions to the stock of money; i.e., on the use of an appropriate concept as a measure and indicator of monetary policy.

Much of the discussion in the earlier sections attempted to describe the prevailing Federal Reserve view of the monetary mechanism. Evidence was presented to support the contention that the dominant notion guiding the Federal Reserve in the post-Accord period has been centered on the role of free reserves as a measure of the impact of policy. Examination of the details of policy operations, supported by statements of the managers and other officials, indicates that free reserves are used as a target and signal of policy as well. We have called this view of the monetary mechanism the "modified free reserves doctrine," since at times there is clear recognition in official statements that the effect of a particular level or range of free reserves is modified by prevailing interest rates and by the distribution of free reserves among classes of banks. In this chapter evidence bearing on the relation of free reserves and the modified free reserves mechanism to the stocks of money and credit is presented.

Two principal sources of evidence will be considered. The first, based on the findings of Meigs' study,¹ considers the effect of interest rates and open market operations on the demand for free reserves and the rate of change of deposits. These findings are concerned with the evidence for a position that some Federal Reserve spokesmen seem to have accepted—that the supply or level of free reserves must be considered in relation to the banks' desired holdings. A second set of findings was developed as a part of the present study. These seek to isolate the effects of interest rates and the level and distribution of free reserves on three measures of money and credit—demand deposits plus currency held by the public, total deposits plus currency held by the public, and total loans and investments of member banks.

The evidence presented confirms in large part some assertions made earlier in this study that the Federal Reserve has failed to develop a

¹ A. J. Meigs, "Free Reserves and the Money Supply" (Chicago: University of Chicago Press, 1962).

useful working knowledge of the monetary mechanism. After 50 years, the System's degree of control over changes in the stock of money or credit, judged in terms of the modified free reserves doctrine, is so pitifully small that retention of free reserves as an important measure or indicator of policy appears to be completely unwarranted.

THE DEMAND FOR FREE RESERVES BY BANKS

Meigs' book began as a study of the factors determining the money supply.² But he did not develop an explanation of the money supply. The closest he came was to consider some possible determinants of the rate of change of demand deposits. His preliminary results led him to investigate the relation between the ratio of free reserves to deposits, interest rates, and the rate of change of unborrowed reserves.³ In the process, he broke important new ground in our understanding of the monetary process by developing and testing a theory of the demand for free reserves by banks.

Meigs' results on this topic can be summarized succinctly. Three of his findings are of particular interest. First, he found that open market operations had only a small positive direct effect on the demand for free reserves. This effect is observable within the month in which the operation is conducted. Experiments with lags suggested that the direct response of desired free reserves to open market operations was substantially stronger in the month following the operation, but the effect remained relatively small withal. Second, the yield on Treasury bills appeared to have a much more important influence on the desired level of free reserves than the direct effect of open market operations. An increase in Treasury bill yields was accompanied by a reduction in the desired level of free reserves. The effect of lagged Treasury bill yields on the demand for free reserves was in the same direction as current yields, but in general the lagged relation was no stronger. Third, Meigs was able to explain by far the larger part of the month-to-month change in the ratio of free reserves to deposits by the proximate determinants of the demand for and supply of free reserves.

We have seen that the Riefler-Burgess view of policy operations, from which the simple free reserves notion appears to have emanated, considered the direct effect of open market operations on reserves to be largely offset by changes in member bank borrowings. It was through such changes in the proportion or volume of borrowed reserves that monetary policy was said to be made effective.

It was previously indicated that during the twenties variations in member bank borrowing and changes in the adjusted base (dominated by the gold stock, Treasury currency and the Federal Reserve banks' portfolio of Government securities) were closely correlated. A dollar change in the adjusted base was associated on the average with a dollar change in the opposite direction of member bank borrowing. This pattern vanished in the thirties and has not reappeared. Even the fifties, though exhibiting substantial variations in the volume of member bank borrowing, show no significant correlation between these variations and changes in the adjusted base. Thus, open market operations immediately modified the supply of free

² *Ibid.*, pp. 3, 66.

³ *Ibid.*, p. 66.

reserves in the postwar period by changing the banks' volume of reserves and excess reserves.

Meigs' investigations reveal, on the other hand, a comparatively small direct effect of open-market operations on the bank's desired level of free reserves. This magnitude appears to respond most decisively to changes in prevailing interest rates. Variations in credit market conditions, expressed by a spectrum of interest rates, induce banks to adjust their reserve position. Open market operations (or other events affecting the magnitude of the adjusted base) thus immediately create a divergence between the banks' desired and actual free reserve position. This divergence triggers a process involving readjustments in the banks' balance sheets and generates modifications in both the money stock and interest rates. The variations in interest rates form an essential part of this process, induced by the banks' endeavor to adjust their actual reserve position to their desired position. This endeavor generates losses in free reserves, via changes in required reserves and currency flows. These losses occur in response to deposit liabilities created or destroyed during the process. Desired free reserve positions respond to the changes in interest rates that accompany the process and also contribute to the elimination of the difference between actual and desired free reserves.

Meigs' investigations suggest a view of the monetary process radically different from the Riefler-Burgess heritage. Our previous discussion emphasized the peculiar character attributed to member bank borrowing and free reserves under the Riefler-Burgess notions and the subsequent evolution of the free reserve conception. Free reserves were typically visualized as a magnitude emerging from a process imposed on banks and independent of any choice behavior on the part of banks. The analysis developed by Meigs, supported by his statistical results, strongly emphasizes the neglected volitional aspects of free reserves. Banks are shown to hold free reserves in response to market conditions.

It follows from Meigs' analysis and results that banks adjust their asset portfolios in response to prevailing levels of free reserves relative to their *desired volume of free reserves*. Some of the answers provided in the context of the questionnaires published in the appendix reveal a partial acknowledgment of Meigs' and similar results. Such acknowledgment is a decisive break with past Federal Reserve conceptions, in particular with the Riefler-Burgess heritage. Numerous policy statements and evaluations made in the past, and repeated in the questionnaire, are inconsistent with the acknowledgment that banks modify their desired free reserve position in response to market conditions.

Meigs' analysis and results also bear significantly on the Federal Reserve's use of various "liquidity measures." Such measures have no meaning by themselves but must be interpreted within an appropriate conception. The Federal Reserve's conceptions bearing on "liquidity" and "liquidity measures," discussed in chapter II, are inconsistent with the best validated portions of economic theory and seriously challenged by Meigs' results. While there is no need to repeat the previous discussion of the use made by the Federal Reserve of the concept of liquidity, it is worth noting (1) that the evidence in Meigs' study supports the argument made earlier and (2) that the

Federal Reserve's use of "liquidity measures" is an indication of their failure to fully understand the meaning of a demand by banks for free reserves. Despite the important role that has been assigned to the demand for free reserves in the responses of the presidents and the governors (see appendix), the evidence suggests that they have not drawn the logical conclusions with respect to "liquidity" and the monetary mechanism.

THE PERCENTAGE CHANGE IN DEPOSITS RESULTING FROM THE INTERACTION OF THE DEMAND FOR AND SUPPLY OF FREE RESERVES

We have noted above that Meigs did not fully develop and test a theory of the relation of free reserves to the money supply. Nevertheless, his findings, about the effect of interest rates, free reserves, and open market operations on the monthly change in deposits, provide important information about the inadequacy of the Federal Reserve's conception. Some of Meigs' findings are summarized here:

1. Meigs constructed a comparatively simple explanation of the monthly percentage change in bank deposits in terms of the interaction of the supply of and demand for free reserves. He was able to account for two-thirds of the variability of the percentage change of bank deposits for the period 1947-58 in terms of his framework.⁴ His results suggest that one-third of the variations in the rate of change of demand deposits is outside the control of the Federal Reserve. Since the currency component of the money supply is excluded from consideration in Meigs' study, we can reach no firm conclusions as yet about the meaning of these findings for the rate of change of the money supply.

2. Free reserves have a *negative* effect on the monthly percent change in demand deposits in Meigs' formulation. The higher the ratio of free reserves to demand deposits, the lower the percent change in deposits, holding interest rates and open market operations unchanged. This implication was strongly supported by the evidence, a finding that flatly contradicts the Federal Reserve's interpretation of free reserves as an indicator of "ease" and "restraint." A rise in free reserves means an increase in measured excess reserves of the banking system or a fall in member bank borrowing. Thus a decline in borrowing is associated with a reduction in the percentage change in demand deposits; an increase in member bank borrowing *raises* the percentage change in demand deposits. Increased member bank borrowing adds to the total reserves of the banking system and contributes to the growth of demand deposits. Moreover, a rise in excess reserves relative to deposits appears to reduce the percentage increase in demand deposits. The Federal Reserve's interpretation of free reserves is directly contrary to these findings. The evidence suggests that their conception is incorrect.

3. The effect of an increase in the percentage of unborrowed reserves (open market operations,) like the increase in borrowed reserves, has an expansive effect on the rate at which demand deposits increase. But the direct effect of open market operations is relatively small in each of Meigs' equations. We have noted above that spokesmen for the Federal Reserve often refer to a six or seven dollar expan-

⁴ *Ibid.*, p. 90, equation T 7. To obtain this explanatory power, Meigs allowed for a separate effect of the interest rate ratio in each month. If this separate, monthly seasonal is neglected, the explanatory power is reduced to 46 percent. See equation T 9, p. 96.

sion of the amount of deposits per dollar of increased reserves.⁵ Meigs' results suggest that the appropriate value of the reserve multiplier is smaller; a 1-percent change in unborrowed reserves is associated with at most a $\frac{1}{2}$ -percent change in the rate of change of demand deposits for given interest rates. Under the conditions prevailing in recent years, Meigs' results suggest that an open market operation had a multiple effect on the change in demand deposits, but the multiplier is between 2.5 and 3, not 6 or 7.

These examples of the evidence available from Meigs' study raise broader questions about the Federal Reserve's conception of the monetary process. Meigs' finds that the direct effect of open market operations on changes in the ratio of free reserves to deposits is much smaller than the indirect effect through interest rates. This raises doubts about the Federal Reserve's rationale for attaching significance to random and often self-reversing changes in float, Treasury balances, etc.

Clearly, more needs to be known about the effect on interest rates of changes in the supply of reserves and the timing and magnitude of the effect of changes in Treasury bill rates on other interest rates. Then a firmer conclusion can be drawn as to whether many of the "defensive" operations are stabilizing rather than destabilizing. Preliminary evidence presented earlier on the variability of monthly changes in the supply of money and the stock of bank credit suggest that these "defensive" operations may be the source of increased instability in the stock of money. Additional evidence on this subject comes from the computation of the monthly changes in the money supply, currency plus demand deposits. The simple correlation of the change in one month with the change in the following or preceding month is negative (-0.20). This suggests the interpretation that an increase in the money supply this month will more likely than not be followed by a decrease in the next month. A similar result is found for monthly changes in bank credit. It is difficult to find any rationale for such variability. By smoothing the extreme variability in bank reserve positions, the Federal Reserve seems to contribute to the variability of money supply and bank credit changes. It is difficult to judge, in the present state of knowledge, the effect of such short-run variability in the financial variables on the pace of economic activity. But there has been no analysis or supporting evidence adduced to suggest that the variability contributes to economic stability.

If variations in float or Treasury balances affect individual banks adversely, there is no reason why open market operations must be used to offset these temporary disturbances. Banks that are under temporary pressure can, if they desire, pay a price to obtain reserves temporarily in the Federal funds market. If no sales of Federal funds are offered at a price less than or equal to the discount rate, banks can borrow from the Federal Reserve banks, i.e., use the discount or collateral loan facilities of the Reserve banks. This may require a change in the Federal Reserve's long-cherished notions about borrowing, although it would seem to be in keeping with the spirit of the original Federal Reserve Act to permit banks to borrow for these short-term purposes. In any case, it is difficult to understand why

⁵ W. Riefler, "Open Market Operations in Long-Term Securities," Federal Reserve Bulletin, vol. 44, No. 317.

the Federal Reserve is willing to supply reserves through open market operations that it might be unwilling to supply through the discount window, since borrowed reserves and unborrowed affect the money supply in a similar way. We will return to a discussion of alternative means of eliminating the undesirable effects of transitory reserve changes in the concluding chapter.

MONEY, CREDIT, AND THE MODIFIED FREE RESERVES DOCTRINE

By asking and answering a number of questions and suggesting some interpretations of the evidence, we can assess the usefulness of free reserves as an indicator of a monetary position and the relevance of the modified free reserves doctrine. The questions that will be asked concentrate primarily on the relation between interest rates, free reserves, the modified free reserves mechanism, money, and bank credit. The answers to the questions are given in terms of computed coefficients of determination. This computation permits us to measure relations between magnitudes and to express the percentage or fraction of yearly or monthly variation in one magnitude that accompanies, i.e., occurs jointly with, another magnitude.

It should be noted that the coefficient of determination gives no indication of cause or effect. If we find that the coefficient of determination between interest rates and free reserves is relatively large, for example, we cannot judge from this observation alone whether changes in free reserves caused changes in interest rates or whether interest rates caused changes in free reserves. All that we can infer from the given observation is the extent to which the two moved together or in opposite directions, perhaps under the influence of a common causal factor. But the observation of such correlations yields support for conceptions asserting a systematic (or causal) association between the magnitudes under consideration. Further observations may be gathered in order to discriminate more sharply between different conceptions compatible with the given gross correlation.

The coefficient of determination between monthly free reserves and the yield on Treasury bills is 0.42 for the 170 months from November 1948 to December 1962. Furthermore, the correlation between the two is negative. These observations support the contention that desired free reserves rapidly adjust to the prevailing volume of free reserves and depend on market conditions. The observed correlation indicates that, under this conception, 42 percent of the variation observed in free reserves during the period are explainable by the concomitant variation in interest rates. Since the correlation is negative, we infer, in addition, that large positive levels of free reserves are associated with low yields on Treasury bills.

These data suggest that there is a closer relation between the level of free reserves and the Treasury bill yield than between the level of free reserves and changes in the stock of money or credit that are considered below. This is similar to the finding of Meigs' study. But, we should note, in passing, that the addition of the years 1959-62 to the data that Meigs used has increased the correlation between free reserves and Treasury bill yields. A possible explanation for the

increased coefficient of determination is that the relation may be stronger in times of high interest rates than in periods of low interest rates.

To go beyond the simple facts provided by the coefficients of determination requires detailed tests of alternative theories about the monetary mechanism. This is not our concern in the present chapter. Here we are interested only in the presentation and interpretation of some elementary facts bearing on the adequacy of prevalent Federal Reserve notions (theories) about the factors influencing the supply of money and bank credit.

The measure that we have chosen, the coefficient of determination, must be between zero and one. The closer that the computed value of this measure comes to one, the closer the correspondence in the movements of the magnitudes under consideration. Conversely, when the computed coefficient of determination is near zero, there is no evidence of any systematic relation between the magnitudes, and there is no indication of any influence running from one to the other. Thus, if we find that the coefficient of variation between free reserves and total reserves is very close to 1, it might make very little difference which of these measures was used in the explanation of the monetary mechanism or interpretation of the events in the money market. Of course, the two might be closely related while neither has a close relation to changes in money and credit.

In addition to the questions and answers about the relation of one monetary factor to another, we will use the coefficient of determination to evaluate the combined effects of a series of separate factors operating jointly on a particular measure of monetary change. For example, we can consider the combined effects on the change in bank credit of (1) the level of free reserves, (2) the distribution of free reserves among classes of banks, and (3) interest rates. The extent to which the positions or levels of these three factors contribute jointly to an explanation of the change in bank credit will be measured by the computed coefficient of determination. The following questions and answers present the evidence on the Federal Reserve's conception of the monetary mechanism in terms of these computed coefficients.

Question 1. Is the monthly change in the supply of money or in member bank loans and investments closely related to the monthly average level of free reserves?

Answer. No. There is almost no evidence of a relation between the level of free reserves and changes in money and credit. The coefficients of determination in table V-1 suggest that the level of free reserves has almost no influence on the change in money supply or member bank credit and vice versa. There is a slight indication that the relation is stronger during periods of expansion than during periods of contraction in the economy. This is particularly true for the monthly change in demand deposits plus currency.

TABLE V-1.—Measures of the relationship between monthly average free reserves and monthly changes in money supply and member bank credit outstanding, November 1948 to December 1962¹

Item	Months of contraction in the economy ²	Months of expansion in the economy ³	All months
Monthly change in currency plus demand deposits.....	0.02	0.14	0.04
Monthly change in currency plus total deposits.....	0	.06	.04
Monthly change in total loans and investments in member banks.....	.01	.02	.03

¹ Figures in the table are coefficients of determination.

² 48 months from National Bureau peaks to troughs during the period November 1948 to February 1961.

³ 108 months from National Bureau troughs to peaks during the period October 1949 through May 1960.

Question 2. Is the relatively poor explanation evidenced by the values shown in table V-1 largely a reflection of extremely short-run money market variations? Wouldn't an average of free reserves taken over a period longer than a month show a substantially stronger relation?

Answer. No. We recall that the 3-week moving average of free reserves was a useful indicator of changes in the direction of Federal Open Market Committee policy. It was sufficiently smooth for major swings in desired policy to be revealed, as indicated in the previous chapter. The monthly averages of free reserves are less erratic than the weekly moving averages. They also mark out clearly the changes in desired Federal Reserve policy. The more appropriate interpretation seems to be that free reserve levels tell almost nothing about the changes in money and bank credit.

Annual moving averages of free reserves were used to provide more evidence on this point. Much of the short-run variation that remained in the monthly data was eliminated by the use of annual data. Seasonal variations in money and credit were eliminated by comparing free reserves to annual percentage rates of change from one month to the corresponding month in the following year. The explanatory power of the relation between free reserves and changes in money and credit improved very little when annual data were used.

Allowing for the distribution of free reserves among classes of banks and allowing for the role of Treasury bill yields as additional explanatory factors did improve the annual results quite a bit. But the best explanation was for the annual percentage rate of change of money, demand deposits plus currency held by the public, and not for total bank credit that is so much emphasized in Federal Reserve discussions of the monetary mechanism. These results are shown in table V-2.

TABLE V-2.—Measures of the relationship between annual moving averages of free reserves and annual percentage rates of change in money and credit, November 1948 to December 1962

Item	Coefficient of determination		
	Using annual average of free reserves	Using (1) and distribution of free reserves by bank class	Using (2) and Treasury bill yields
	(1)	(2)	(3)
Annual percent rate of change in demand deposits plus currency.....	0.08	0.33	0.45
Annual percent rate of change of total deposits plus currency.....	.03	.24	.42
Annual percent rate of change of total loans and investments of member banks.....	.08	.29	.34

Question 3. Do measures of the distribution of free reserves and interest rates have a similar effect in improving the explanatory power for *monthly* changes in money and bank credit?

Answer. No. For the 170 monthly changes in bank credit and money between November 1948 and December 1962, there is almost no improvement when we allow for the distribution of free reserves between classes of banks, the yield on Treasury bills, and/or the ratio of Treasury bill yields to the prevailing rediscount rate. This is shown in table V-3.

TABLE V-3.—Measures of the relationship between monthly changes in money and credit and the level and distribution of free reserves and interest rates, November 1948 to December 1962

Item	Coefficients of determination		
	Using free reserves and their distribution	Using (1) and Treasury bill rates	Using (1) and the ratio of Treasury bill rates to rediscount rates
	(1)	(2)	(3)
Monthly change in currency plus demand deposits.....	0.04	0.05	0.05
Monthly change in currency plus total deposits.....	.07	.10	.07
Monthly change in total loans and investments of member banks.....	.05	.06	.06

Question 4. Do the data in the last column of table V-3 provide evidence about the modified free reserves doctrine as an explanation of monthly changes in money and credit?

Answer. Yes. The evidence in column (3) suggests that the modified free reserves doctrine provides almost no explanation of monthly changes in money or credit.

Question 5. Does the relatively weak relation for both monthly changes in money and monthly changes in bank credit suggest that while neither is closely related to free reserves, changes in money and credit are closely related to each other?

Answer. No. Changes in money and credit have a monthly coefficient of determination of 0.01 when money is measured as de-

mand deposits plus currency. These data indicate that there is no support whatsoever for the position that monetary expansion and credit expansion are one and the same, as the Federal Reserve spokesmen have maintained.

Question 6. Is the relatively weak support for the modified free reserves doctrine and the relation of free reserves to changes in money and credit partly explained by the relatively low interest rates of the pre-Accord period and the early post-Accord period?

Answer. Yes, there is some support for this interpretation from the evidence on changes in the stock of money. For changes in the stock of credit, the evidence suggests the opposite conclusion as shown in table V-4. But the explanatory power remains small. Moreover, there is very little evidence of any steady direction of change in either the stock of money or credit. The correlation between the successive changes in the money supply in adjacent months is small and negative. The same is true for monthly changes in bank credit as noted earlier. Despite the fact that both of these changes have been positive on the average over the 14-year period, an increase in money or credit in one month is not a reliable indication that there will be an increase in the following month.

TABLE V-4.—Measures of the relationship between monthly changes¹ in money and credit and the level and distribution of free reserves and interest rates, 8 postwar periods

Item	Coefficients of determination		
	Using free reserves and their distribution	Using (1) and Treasury bill rates	Using (1) and the ratio of Treasury bill rates to rediscount rate
	(1)	(2)	(3)
November 1945 to July 1953			
Monthly changes in currency plus demand deposits.....	0.05	0.08	0.05
Monthly change in currency plus total deposits.....	.10	.16	.15
Monthly change in total loans and investments of member banks.....	.24	.21	.25
July 1953 to July 1957			
Monthly changes in currency plus demand deposits.....	0.14	0.20	0.14
Monthly change in currency plus total deposits.....	.09	.09	.09
Monthly change in total loans and investments of member banks.....	.05	.05	.25
July 1957 to May 1960			
Monthly changes in currency plus demand deposits.....	0.32	0.32	0.41
Monthly change in currency plus total deposits.....	.36	.37	.37
Monthly change in total loans and investments of member banks.....	.10	.11	.10

¹ Using monthly percentage rates of change gives very similar results.

It should be noted also that the monthly variation in free reserves has been smaller in the past few years than in the years of the early fifties when swings in free reserves of more than \$500 million were more frequent. Accompanying the greater stability in the level of free reserves, there has been a growth in the number of banks participating actively in the Federal funds market. These changes in market conditions, or arrangements, probably help to account for the steady improvement in the relation between free reserves and changes in money supply and in the influence of the modified free reserves mechanism on changes in the money stock. But, of course this explanation cannot account for the very poor relation between free reserves and bank credit that we observe from July 1957 to May 1960.

Question 7. Is there any additional evidence that the factors included as part of the modified free reserves doctrine have different effects in periods of relatively low interest rates and economic activity and periods of relatively high interest rates and economic activity?

Answer. Yes; the evidence in table V-5 suggests this conclusion for the changes in currency plus demand deposits. Interest rates were higher on the average in 108 months from trough to peak than in the 46 months from peak to trough. The modified free reserve doctrine is a better explanation of changes in the stock of money in months from trough to peak. We have noted earlier that the level of free reserves was more closely related to interest rates in recent months when interest rates have been higher on the average.

TABLE V-5.—Measures of the relationship between monthly changes¹ in money and credit and the level and distribution of free reserves and interest rates in months of expanding and contracting economic activity

Item	Coefficients of determination		
	Using free reserves and their distribution	Using (1) and Treasury bill rates	Using (1) and the ratio of Treasury bill rates to rediscount rate
	(1)	(2)	(3)
46 months from peak to trough			
Monthly change in currency plus demand deposits	0.06	0.06	0.10
Monthly change in currency plus total deposits12	.17	.18
Monthly change in total loans and investments of member banks.....	.02	.03	.08
108 months from trough to peak			
Monthly change in currency plus demand deposits	0.14	0.21	0.15
Monthly change in currency plus total deposits07	.10	.07
Monthly change in total loans and investments of member banks.....	.04	.05	.04

¹ Using monthly percentage rates of change gives very similar results.

This circumstance might explain the relative improvement in the relation between the level and distribution of free reserves and changes in money supply during the 108 months from peak to trough (col. 1).

Data for the three periods shown in table V-4 suggest that the association between changes in the money stock and free reserves is stronger in high interest rate periods than in periods of comparatively low interest rates. The average level of interest rates rises from period to period as we move down the table and the explanatory power measured in columns 1, 2, and 3 rises also. But the improvement in explanatory power holds only for changes in the stock of money; it does not appear when we consider changes in member bank credit.

Table V-5 again indicates that the improvement in the explanatory power of the modified free reserves doctrine in periods of comparatively high interest rates applies to changes in the stock of money but not to changes in the stock of credit. Reasons for the Federal Reserves attachment to, and emphasis on, credit cannot be obtained from the evidence that we have examined. None of the evidence gives any indication that there is a reliable association between free reserves, or the modified free reserves mechanism, and the change in bank credit.

Question 8. Do the findings suggest that further modifications and tests of the Federal Reserve explanation of the monetary mechanism, centered on the free reserves doctrine, would be useful?

Answer. We can never be certain that additional modifications would not improve the explanatory power. One can only try. But the accumulated evidence falsifies so many of the features of the Federal Reserve conception that time can more usefully be spent developing an alternative explanation that avoids these errors.

Question 9. Do the poor results obtained necessarily indicate the irrelevance of a conception inherited from the Riefler-Burgess tradition and centered on the free reserve mechanism?

Answer. No. Such results might be obtained under a coherently formulated free reserve conception if the adjustment of the banks' portfolio of earning assets is very rapid. In particular, little association between the variations in money stock or bank portfolios and free reserves would remain in monthly data, if the adjustment process is concentrated within a month. Under such circumstances the central relation of the Federal Reserve's conception, associating "credit-expansion" and free reserves, would operate significantly only in the shortest run and could not be detected in the monthly data used here. But in this case some other problems arise.

If this formulation of the free reserve conception is advanced, free reserves must be abandoned as an indicator of a monetary situation and as a target of monetary policy. The interaction of the relation centered on free reserves with other pertinent relations, constituting the structure of a rapidly adjusting

process, implies that free reserves cannot be interpreted as an indicator or used as a target by the Federal Reserve authorities. Furthermore, other implications of the reformulated free reserve conception can be shown to be seriously incompatible with validated portions of economic analysis. Thus either the central relation of the Federal Reserve conception is seriously invalidated by the observations presented, or a reformulated conception, compatible with the data in tables V-1 to V-5, is incompatible with the burden placed on free reserves as an indicator and target by the Federal Reserve authorities.⁶

SUMMARY AND CONCLUSION

The four chapters discussing and analyzing the Federal Reserve conception of the monetary mechanism are now complete. In our general overall view and summary in chapter II, we noted some of the logical and factual errors that mar the Federal Reserve's understanding of the mechanism. And we looked at some of the reasons for these errors—particularly their extremely short-run orientation, their concern with daily or weekly defensive operations, their tendency to view the banking system as analogous to a single bank. We noted repeatedly that if the Federal Reserve had looked seriously at the evidence, they would not persist in repeating these errors.

Sections 1 and 2 attempted to demonstrate that particular factors, summarized in the modified free reserve doctrine, have dominated the prevailing Federal Reserve view. Inconsistencies, qualifications, and modifications that appear from time to time made this task laborious and difficult. But the evidence from the "Record of Policy Actions" and the repeated references to the same factors suggested quite strongly that the modified free reserve doctrine comes reasonably close to a statement of some of their dominant views. In arriving at this judgment, we noted that the absence of a clear, generally accepted statement of the mechanism, the concern with hourly, daily, and weekly money market changes, and the emphasis on "defensive" operations contributed to a substantial grant of authority to the Manager of the System Open Market Account.

In this section, some of the evidence on the Federal Reserve's conception of the mechanism controlling the stock of money has been assessed. We found that the relation between Federal Reserve policy and the change in money and credit is quite poor judging from the monthly and annual data used in our tests.

A new question arises, therefore: Does it really matter very much what the Federal Reserve does? By far the larger part of the monthly and annual changes in money and credit seem to be outside their control, judged by their conception of the mechanism.

The proviso of the last sentence is the crux of the matter. If the Federal Reserve's conception of the monetary process, centered on the position of free reserves, were the only admissible view, we would have to concede that monetary policy is little more than a futile exer-

⁶ The statements in the above answer are based on an underlying analysis to be published in another context: "Evolving Federal Reserve Conceptions Concerning the Money Supply Process."

cise. But alternative conceptions of the monetary mechanism have been formulated, and it is essential to consider them before accepting such a negative conclusion. It should be noted, therefore, that our analysis does not suggest the futility of monetary policy but only supports our contention about the failure of the Federal Reserve to develop a coherent, validated conception.

The failure of the Federal Reserve to develop a useful conception of the monetary mechanism does not mean that one cannot be developed. The following chapter will present an alternative view of the mechanism that places emphasis on substantially different factors and suggests a much more reliable association between the money supply and policy actions.

