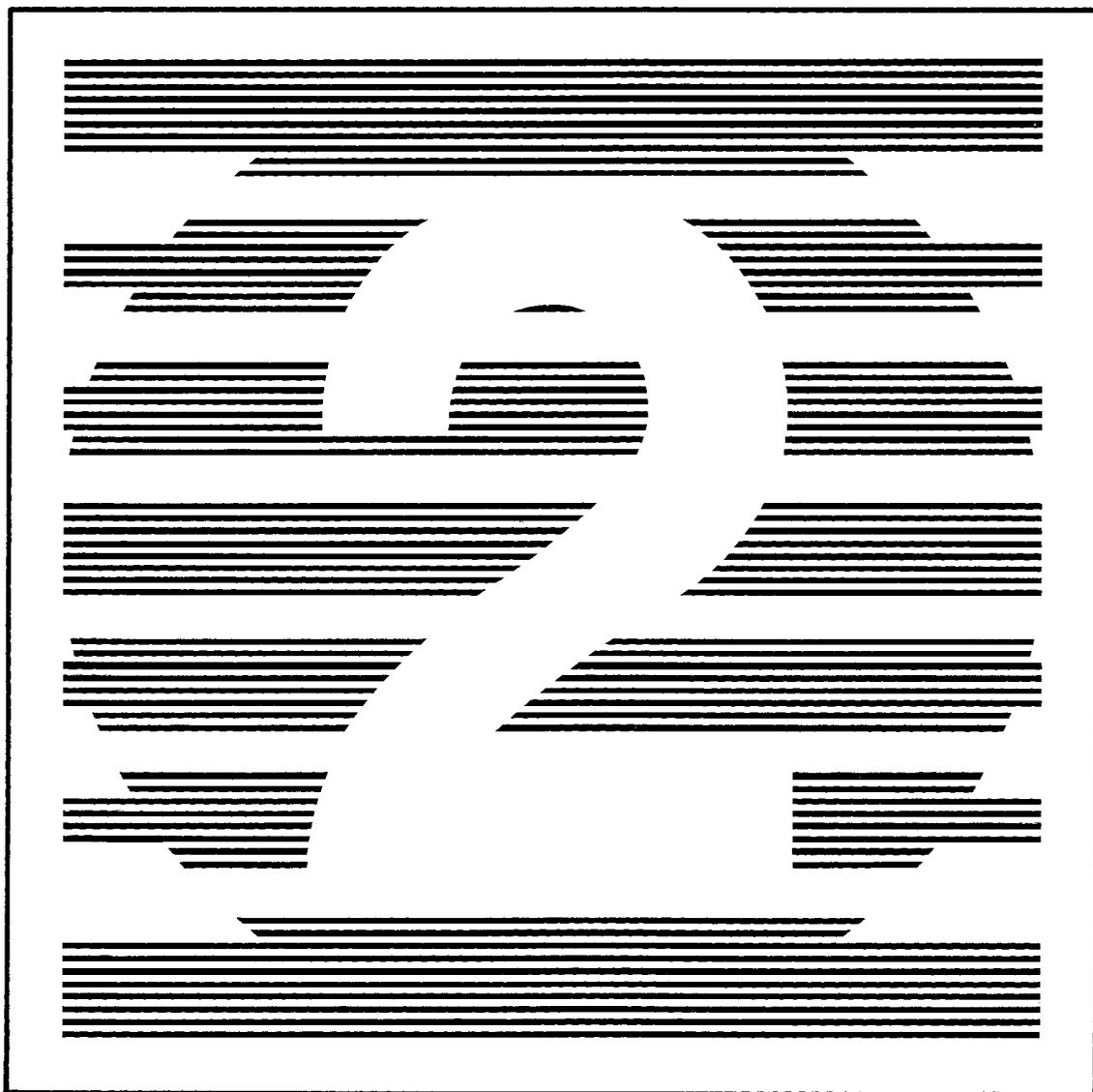

Volume 2

REAPPRAISAL OF THE
FEDERAL RESERVE DISCOUNT MECHANISM



Board of Governors of the Federal Reserve System

PUBLISHED IN DECEMBER 1971

Library of Congress Catalogue Card Number 70-609110

Copies of this report may be obtained from Publications Services, Division of Administrative Services, Board of Governors of the Federal Reserve System, Washington, D.C., 20551. The price is \$3.00 per copy; in quantities of 10 or more sent to one address, \$2.50 each. Remittances should be made payable to the Board of Governors of the Federal Reserve System in a form collectible at par in U.S. currency. (Stamps and coupons not accepted.)

Volume 2

REAPPRAISAL OF THE
FEDERAL RESERVE DISCOUNT MECHANISM

CONTENTS

THE LEGITIMACY OF CENTRAL BANKS	1
Kenneth E. Boulding	
SELECTIVE CREDIT CONTROL	15
Lester V. Chandler	
A REVIEW OF RECENT ACADEMIC LITERATURE ON THE DISCOUNT MECHANISM	23
David M. Jones	
SUMMARY OF ISSUES RAISED AT THE ACADEMIC SEMINAR ON DISCOUNTING	47
Priscilla Ormsby	
SOME PROPOSALS FOR A REFORM OF THE DISCOUNT WINDOW	59
Franco Modigliani	

CONTENTS cont.

AN EVALUATION OF SOME DETERMINANTS OF MEMBER
BANK BORROWING 77

Leslie M. Alperstein

TOWARD A SEASONAL BORROWING PRIVILEGE:
A STUDY OF INTRAYEAR FUND FLOWS
AT COMMERCIAL BANKS 93

Emanuel Melichar

CAPITAL AND CREDIT REQUIREMENTS OF AGRICULTURE,
AND PROPOSALS TO INCREASE AVAILABILITY
OF BANK CREDIT 107

Emanuel Melichar and Raymond J. Doll

THE LEGITIMACY OF CENTRAL BANKS

Kenneth E. Boulding

University of Colorado

THE LEGITIMACY OF CENTRAL BANKS

The problem of legitimacy is one of the most neglected aspects of the study of social systems. There may be good reasons for this because legitimacy is inevitably a hot subject. One can hardly discuss the legitimacy of anything without seeming to threaten it, for a great deal of legitimacy depends on things being taken for granted and not being talked about at all. The more one looks at the dynamics of social systems, however, the more it becomes clear that the dynamics of legitimacy is one of the most important elements in the total long-run dynamics of society. It certainly ranks with such things as population and demographic movements, and even with technological change with which it is closely intertwined. Its importance can be seen in the remark that a person or institution that loses legitimacy loses everything and can no longer maintain itself in the social system. No amount of wealth—that is, exchange capability—or power—that is, threat capability—can keep an institution alive if there is a widespread denial of the legitimacy of its role in society. This is because the performance of any continuous and repeated role requires an acceptance of its legitimacy on the part of those role occupants whose roles are related to it. A role in the social system is a focal point or node of inputs and outputs of many different kinds, the output of one role being the input of another. Inputs,

therefore, depend on the willingness of other role occupants to give outputs, and they will not do this continuously unless there is legitimacy. Where people feel that certain outputs are illegitimate they will eventually find ways of stopping them. The corresponding inputs will likewise stop. To use a rather crude illustration, a bandit can take your money once, but anyone who wants to take it every week either has to be a landlord or a tax collector, or perhaps even a bank.

There are a considerable number of sources of legitimacy, and the functions that relate the determinants of legitimacy to its amount are extremely complex. Such functions are certainly nonlinear and they exhibit discontinuities that are, to say the least, disconcerting. Sometimes an institution, the legitimacy of which seems to be absolutely unquestioned, collapses overnight. All of a sudden we reach some kind of a “cliff” in the legitimacy function and the institution suddenly becomes illegitimate. The same thing perhaps can even happen the other way, in which institutions quite suddenly become legitimate after having been illegitimate. A good example of the former is the collapse of the monarchy, beginning in the 17th century. The legitimacy of monarchy survived the Cromwellian war in England, largely because an ancient legitimacy is like a capital stock—it takes a great deal of

spending before it can be exhausted. At the time of Louis XIV in the following century one might have thought the legitimacy of monarchy was absolutely unquestioned and secure. In the 19th century, however, monarchies collapsed nearly everywhere and the only monarchs who survived were those who abandoned their power and became symbols of legitimacy, like the British, Dutch, and Scandinavian monarchs. On the other side, abortion has been an institution that has been regarded as highly illegitimate and now in the face of the population problem seems to be acquiring a sudden legitimacy.

We may distinguish at least six classes of *sources* of legitimacy; that is, variables in society that are functionally related to legitimacy. The first consists of the payoffs of the institution in question. If an institution provides good terms of trade with those who are related to it, this contributes to its legitimacy up to a point, especially in the long run. The case is clearer on the negative side. An institution that has very poor payoffs—that is, demands a great deal of input from other people and gives very little output to them—is likely to have its legitimacy eventually eroded on this account. The relationship, however, is certainly nonlinear and quite complex, and at times may even be negative. Just because an institution is useful and pays off well is not sufficient to give it legitimacy.

Paradoxically enough, it is not merely good payoffs that give legitimacy but also bad payoffs; that is, sacrifices—the second source. A sacrifice or “grant” may be defined as a one-way transfer from one decision unit to another, in contrast with exchange, which is a two-way transfer, from A to B and also from B to A. The structure of one-way transfers of commodities and exchangeables, I call the “grants”

economy, and it is a good first-approximation measure of the extent and structure of the integrative system in general. If A makes a grant to B, the implication is that A identifies with B, A and B are in a community together, and A clearly regards B as legitimate. The dynamics of the grants system is very complex because to some extent grants are self-justifying. If A makes sacrifices for B, it is very hard for A to admit to himself that these sacrifices have been in vain. This would be a threat to his identity, which is the greatest threat that any person can feel. There is, therefore, a strong tendency to “throw good money after bad” and to continue making sacrifices for some institution, even after some possibly expected long-run payoffs have failed to materialize. This is what I call the “sacrifice trap.” We see this in the family, for instance, where the devotion of one spouse to an unsatisfactory partner often continues for a long time in spite of very unsatisfactory internal terms of trade. A spouse who gives a lot to a marriage and gets very little out of it may continue to do so because of the threat to the personal identity should the process ever stop. There may come a point, of course, at which the terms of trade become too bad altogether and a break-up ensues. This is the “cliff” phenomenon in the legitimacy function. The same thing evidently happened to the monarchy, and it can happen to religion, like the religion of the Aztecs. It could even happen to the national state.

The third source of legitimacy is age. Institutions build up legitimacy just by sticking around, as long as there is an excess of production over consumption. Even this function, however, may be nonlinear. Up to a point increase in age increases legitimacy; beyond a certain point, however, the senator becomes senile and the good old things become old-fashioned. One can

detect, perhaps, three phases of the function. When things are new, they have the special legitimacy of babies, young people, or the new fashion. At a certain point they become middle-aged or old-fashioned and legitimacy declines sharply. Then as time goes on, they become antiques and legitimacy increases once again. In the case of a creative person, for instance, one often finds a phase of rising legitimacy with age and then a declining phase as he gets out of date, and then an increasing phase as he acquires a posthumous reputation, which is presumably the personal equivalent of being an antique.

The fourth source of legitimacy is mystery. Something that is not understood but that is dimly perceived as obscurely grand and magnificent acquires an aura of legitimacy simply because it is secret and we do not understand it. The temples and impressive ceremonies of religion, the state of kings, the mystique of the brass hat and the military leader, the sanctity of priesthoods of all kinds, and even the mystery of science and the laboratory are all related to this aspect of legitimacy. It depends, of course, on a class structure, on a distinction between the initiates and the common people. Historically, it has been a very powerful source of the willingness of the common people to make sacrifices for the benefit of the initiates and to afford them a great deal of legitimacy, often in the absence of much in the way of tangible returns.

Closely related to this aspect of legitimacy is ritual or artificial order. Man has always feared the randomness of his environment, the uncertainty of the weather, the crops, accidental injury or death, disease, his whole future state. One of his responses to this has been to create little islands of artificial order, regularly repeated

rituals, liturgies, and human law. The role that law plays in legitimation is closely related to this aspect of it as ritual. To say that law and ritual are artificial orders is not in any sense to deny them validity, nor does it mean that these artificial orders are arbitrary. Where they are successful it is precisely because they reflect an order in the real world, whatever that is. Nonetheless, they are artificial in the sense that they create an island, as it were, of life and experience that is separated from the rest of the world. A monastery is a good example of such artificial order; so is a law court. Insofar as the need for legitimation is closely related to the need for regularity and for law in the broad sense of regularity and nonrandomness, we can easily see why the development of these artificial orders of liturgy and legal procedure, of due process, and of repeatable and predictable behaviors and decisions are an important aspect in the legitimation process. Here, too, however, we may run into nonlinear relationships. Beyond a certain point an artificial order becomes too artificial, and if protest arises against it, the legitimacy of the institution that is based on it may suddenly collapse. The Reformation, perhaps, may be interpreted as a protest against too artificial an order in the Roman Catholic Church. The fact that law does not always maintain legitimacy, as the experience of prohibition indicated, also suggests that law too may be "a hass" in the memorable words of some unmemorable character in Dickens, and when it is perceived to be such, the legitimacy on which it is based easily collapses. There are many countries today, indeed, in which law is much less legitimate than it is in the United States, and the legitimacy of law itself is a problem to which we have given far too little attention.

The sixth source of legitimacy consists of the alliance of an institution with other legitimacies. This is what might be called the legitimacy syndrome. If there are institutions that already possess a great deal of legitimacy, it is possible sometimes for new and nonlegitimate institutions to acquire legitimacy by identifying themselves with the legitimate ones. It is easy to cite examples of this. The United States built Washington in the classical tradition of ancient times. The United States, being a new and therefore rather illegitimate Republic, sought to establish its legitimacy by means of a "tie-in" with Corinthian columns and handsome domes. The legitimacy of a religion often permits highly radical and otherwise illegitimate movements to spring up within it, like the Franciscans, or, in our day, the movement for racial equality or even the peace movement. Here again we may run into nonlinearities in the relationship. The *nouveau riche* person who builds a very fancy house may thereby diminish rather than enhance his legitimacy in the eyes of those he most wishes to impress. A country that wastes its scarce resources on building a vast presidential palace or a grand new capital may not acquire much legitimacy thereby, but only the subtle sneers reserved for unwise decision-makers. One interesting phenomenon here is that the more legitimacy an institution has, the less it has to worry about these alliances. In the early days of a university, for instance, it often builds elaborate Gothic or classical buildings to tie in with the legitimacy of the past and to pretend that it has the legitimacy of spurious age. As it acquires genuine legitimacy, however, perhaps in the process of providing payoffs, its buildings become skimpier and more austere and it puts less and less into ritual and into elaborate architecture until

finally it ends up by abandoning gowns, Gothic buildings, ivy, and even grass as it lays down its campus to enormous parking lots.

Let us now apply this analysis as far as we can to the problem of the legitimacy of the banking system, and of the central banks in particular. The existence of socialist states shows that this is not an idle problem. Socialism indeed can be interpreted largely as an attack on the legitimacy of certain institutions of exchange, and in the socialist states we see the very interesting phenomenon of the gradual re-establishment of many of these same institutions with a different framework of legitimation. In the Western World and especially in the United States, the legitimacy of the banking system is almost completely taken for granted. It must not be assumed, however, that the banking system or any other institution necessarily creates its own legitimacy, and it must not be assumed that this legitimacy could never disappear, even though it might seem at the moment to be quite unshakable. The possessors of unshakable legitimacy should always remember Louis XVI at least once a day, even though the Federal Reserve is not the sort of place where heads are likely to roll. It will at least be an interesting exercise, therefore, to apply the six major sources of legitimacy to the banking system and see if any dynamic patterns emerge.

The payoffs of the banking system to the rest of society are fairly positive and also are fairly visible. Most people outside the banking system have contact with it either through using a checking account, which is clearly a great convenience and for which the payment does not seem exorbitant, or through borrowing money, which again we would not do unless we thought that the returns were likely to be

greater than the costs. The banking system is perhaps the purest example of an exchange institution. It lives almost entirely by exchange, it does very little physical transformation, and the utilities that it creates out of which payoffs to the various parties come are essentially exchange utilities, such as the creation of convenient forms of exchangeables like checking accounts, or the separation of ownership from control and the placing of asset complexes in the control of those who presumably know how to manage them best. The legitimacy of banking, therefore, falls or rises with the legitimacy of exchange itself.

Even though the payoffs to the banking system for those who deal with it are clearly positive—for it is an essential characteristic of exchange systems that continued exchange would not take place unless there are positive payoffs to all parties—this in itself is not sufficient to give legitimacy, although it helps. The somewhat loose relationship between payoffs and legitimacy may happen for two reasons. The first, which applies to all exchange institutions, is that an exchange, perhaps because it involves so little in the way of sacrifice, does not generate strong integrative sentiments and feelings. My own bank once advertised as “the bank that puts people first.” Everybody knows, however, that this is a ritualistic remark designed solely to create favorable sentiments. If, indeed, I thought it true, I probably would not bank there, for what we really want in a bank is that it puts money first. In other words, we want extreme probity in accounting, with not a cent out of place, and if this involves some sacrifice of a charming but careless accountant or a benevolent embezzler, I doubt very much if we would fight for putting people first. There have been a number of cases, indeed, of benevolent bank officers

who embezzled in order to do good, and this act is usually frowned upon quite severely. I, at least, want banks to be honest, impeccable, and full of rectitude. I do not necessarily want them to be lovable, in spite of some of their advertising. Nevertheless, this absence of lovability in exchange institutions not only seems to worry banks, but it may occasionally lead to their overthrow. Schumpeter, we may recall, argued that capitalism would be overthrown by its very success and because the rationalistic attitude that it generated would destroy the integrative institutions in, say, the family or the church, or even the state, which enable exchange to be legitimated. Exchange and exchange institutions, in other words, simply pay off too well. They do not demand any sacrifice. Thus an institution that bases its legitimacy on its payoffs may be challenged by another institution that claims to have even better payoffs. This is one reason, perhaps, why legitimacy that is based merely on payoffs is a little insecure, whereas a legitimacy that is based on sacrifice is remarkably stable.

It is at least an amusing fantasy to suppose that we might do a cost-benefit analysis of the financial system and, indeed, of competing financial systems. The costs are fairly easy to identify. We could, for instance, do a comparative study of, say, Austria and Hungary, two countries at about the same level of development, one of which has a predominantly market-based financial system and the other being a socialist state. We could find out fairly easily the costs of the two systems in terms of resources absorbed into them based on the economy in general. We could find out, for instance, what proportion of the gross national product in each case was absorbed by the financial system. The benefits, of course, would be much harder to assess.

Indeed, I would almost despair of ever making a quantitative assessment of them. It is on judgments of this kind, however, that the long-run competition between socialism and capitalism may ultimately be determined.

Merely asking a question of this kind, however, may seem somewhat threatening to the legitimacy of either kind of institution. The legitimacy of the institutions of capitalism could depend a good deal on their simple age; that is, just on the fact that they are not questioned and that we have gotten along with them for a long time with reasonable success. It is one of the curious problems of the dynamics of legitimacy, indeed, that a threat to legitimacy is very hard to counter where the legitimacy itself is a function of age and ritual, for even an attempt to defend a legitimacy of this kind may destroy it. This perhaps is one reason why the Marxist threat to the legitimacy of capitalism was so much more dangerous than would be the case if the legitimacy depended merely on payoffs.

The payoffs to capitalism are actually quite high. A good deal of its legitimacy, however, depends on institutions like private property, the legitimacy of which had never really been questioned, and rests not on the perception of long-run payoffs at all, but simply on age, long use, and the ritual of law. The legitimacy of socialist institutions likewise depends in good measure on the enormous sacrifices that have been made to create them. The socialist state stresses much more fiercely than the late President Kennedy: "Ask not what your country can do for you, ask only what you can do for your country." Because it has demanded enormous sacrifices of its people, in the interests of an ideal, its people do not like to admit that the ideal might not have much in the way of payoffs.

Hence, the suggestion that the relative merits of the systems should be tested by cost-benefit analysis would probably be even more threatening to the socialist than it is to the capitalist.

Let us now take a brief look at some of the other sources of legitimacy and see how they apply to the banking system. We have already noticed that banks are not institutions that demand sacrifice, except perhaps sacrifice of temptations to dishonesty and extravagance. Banks, therefore, are not "heroic" institutions, and they cannot hope to inspire the kind of love and loyalty that such institutions as the church and the national state inspire.

The banking system is, relatively speaking, a fairly modern institution. It cannot perhaps draw a great deal of legitimacy from its age, although we do find banks and institutions of all kinds advertising the date of their foundation—when that is suitably distant in time—as evidence of their integrity, respectability, and legitimacy. The Bank of England's affectionate title as "The Old Lady of Threadneedle Street" indicates that age is perhaps not a negligible factor.

The sense of mystery and charisma is also far from a negligible factor in establishing the legitimacy of banks. The bank may not be a heroic institution, but it is certainly mysterious to the ordinary person. Most people who use banks, and indeed a good many people who operate them, really do not understand the operations of the banking system as a whole. There is, furthermore, a lingering sacred quality about money itself. There is something a little mysterious about the fact that mere green pieces of paper or, even more remarkable, a signature on a check is sufficient to buy tangible objects. In the past, at least, banks have contributed to the sense of mystery by

their very architecture, which has often tended to be quasi-religious. Even if banks shied away from the more subtle mysteries of the Gothic, they have frequently enshrined themselves in pagan temples and Corinthian columns, lofty ceilings, marble floors, and a general air of hushed magnificence that hopefully induces in the customer the frame of mind of proper respect and reverence.

Ritual, likewise, plays a not insignificant role in establishing the legitimacy of banks. Regular hours, standardized procedures, and a highly formalized accounting system contribute to a sense of regularity and order. The banking system, furthermore, is strongly hedged about by legal safeguards and the ritualistic language of contracts. Alliances with other legitimacies are seen not only in the architecture but also in the institution of boards of directors—the members of which are drawn from other respectable institutions in the community—and also in the institution of the charter granted by the state or by the nation, which brings along with it a certain apparatus of inspection and oversight. We could even regard national deposit insurance, quite apart from its strictly economic aspects, as an alliance with the enormous legitimacy of the national state, for then behind even the most private of banks stands the majesty and legitimacy of government.

We now come rather belatedly to what is supposed to be the main object of this paper, which is the problem of the legitimacy of central banks. Central banking is a rather late development in the banking system. Even in Great Britain the Bank of England did not begin to act as a central bank until well into the 19th century. The United States got along for the most part without any central bank until 1913, although before that it had something that

might almost be called an informal central banking system. Until the establishment of the Federal Reserve System, the necessity of central banking was still a matter of debate. The Japanese, for instance, when they began to introduce Western institutions started with something like the American national banking system, and developed a central bank only after a number of financial crises. Today, however, the legitimacy, indeed almost the necessity, of central banking seems unquestioned. Every new country sets up a central bank almost as soon as it is established. It is part of what every well-dressed country will wear.

If we look down our six sources of legitimacy, we will see that almost everything that can be said of the banking system in general applies also to central banks. Here they have unquestionably risen in response to a felt need. There must, therefore, be some kind of a payoff to the organization. These, however, may be of two kinds: market payoffs and political payoffs. The fact that even under a free banking system some strategically located banks tended to perform the functions of a central bank—in that part of their deposits were owned by other banks and regarded as reserves—suggests that the function of central banking is something that will develop even in a pure market system, simply because there are payoffs for this kind of organization; that is, central banking can provide adequate terms of trade for *all* those with whom it exchanges. There are clearly great conveniences, for instance, in the clearing function and in commercial banks holding their reserves in the form of deposits in some central banks—whether this clearing be public or private; the sheer dynamics of a free financial market would almost certainly throw up the institution of central banking in one form or another.

Without any exception, as far as I know, however, societies have not permitted central banking to grow simply as a result of market forces, but have always intervened in the matter politically. At some point in the development of the system, those who are in control of the legislative process of society perceive certain payoffs in the development of a government central bank that can then be used to control the private banking system. In its political aspects the government central bank can then be seen as a partial movement toward the socialization of the banking system; such socialization leaves the ownership of most of the institutions of the system in private hands, but uses the government central bank as an instrument of control. This may be regarded for the most part as a problem in the legitimation of power. Because of the very structure of the system, a central bank, whether public or private, will have a great deal of power; that is, the decisions of its responsible decision-makers will have repercussions extending through the whole system of the society. Power, however, as we have seen, to be exercised continuously must be legitimated, and governmental institutions are the principal agency of legitimation in modern society. Private power will only be tolerated if it is small. This, indeed, is the theory behind the encouragement of competition as a regulating factor, for in a competitive society the power exercised by any particular private decision-maker is relatively small and is constantly checked by his competitors. Central banking, however, as in electric power or telephones, has the great advantage of monopoly, which means a concentration of power, and if this concentration is to be legitimated, it must be regulated in some way through governmental organization. Hence, it is not surprising to find a strong

tendency for government to take over the central banks, even though, as in the case of the Bank of England, nationalization may make practically no difference to its day-to-day operation or even its general policy.

In this picture the Federal Reserve System presents some rather curious anomalies, which may, however, in the American context be more apparent than real. The Federal Reserve System, like the Bank of England before its nationalization, is theoretically privately owned and is a series of interlocking corporations, theoretically owned and controlled in large measure by the member banks themselves. In reality, of course, the Federal Reserve Banks are public institutions, exercising the great power that they have, not to make profit for themselves, but to advance what they conceive to be the public interest. Public representatives sit on their boards of directors and the members of the Board of Governors of the Federal Reserve System are appointed by the President of the United States and confirmed by the Senate. The structure is thus less socialized than that of the Post Office and more socialized than the American Telephone and Telegraph Company, although there are certain parallels between the Board of Governors of the Federal Reserve System and a regulatory commission for public utilities.

In the American system of legitimacy these apparent anomalies actually make a good deal of sense, for the American people have a curious ambivalence towards government. On the one hand government is a strong source of legitimacy; on the other hand it is also regarded as something that is always potentially illegitimate and can get out of hand. Hence, government has to be hedged around with all sorts of constitutional safeguards. The American

Constitution can be interpreted in considerable measure as a kind of treaty between a people and its own government regarded as a potential enemy! Consequently, in the United States government does not have any monopoly of the legitimating process, and private institutions—simply because they are private—have a certain legitimacy of their own. It is not surprising, therefore, to find in the United States this curious mix of the public and the private that we find in the Federal Reserve System, and it can certainly be regarded, for its time, an optimum solution for the maximization of legitimacy. Today, certainly, there seems to be no major threat within the American system to the legitimacy of the Federal Reserve System, although there have been frequent and perhaps justified criticisms of its policies. As far as I know, there are no serious proposals either to nationalize the Federal Reserve Banks, or to put them under the U.S. Treasury, or to dissolve them and go back to a system of free banking. The principle of separation of powers is still very strong and the notion of the Treasury and the Federal Reserve System as two separate fiefs within a broad structure of governmental legitimation does not seem to be seriously threatened.

Most of the other aspects of legitimacy that we noticed as being characteristic of the banking system also apply to the Federal Reserve System. Like the rest of the banking system, Federal Reserve Banks are not heroic institutions, although their association with the national state hangs over them a certain cloak of sacrifice-legitimation, especially insofar as they may have to sacrifice their own ideals of financial probity in times of war. Bankers of all sorts tend to be deflationary- rather than inflationary-minded and it must hurt their souls a little to be accomplices in the infla-

tionary financial policy that invariably accompanies a war. This sacrifice of financial honor, however, is small compared with the sacrifices of the soldier, although it may not be insignificant in contributing to the legitimacy of the institution. Certainly, if central banks were to oppose a war effort on the grounds that it offended their financial principles, their unwillingness to sacrifice their principles would not be taken kindly and would contribute rapidly toward the loss of their legitimacy.

Central banking is now old enough to have acquired a little of the sanctity of age, and it is certainly shrouded in a great deal of mystery and acquires a certain legitimacy from this fact as well. Where ordinary men and ordinary brokers have at least some familiarity with the operations of the member banks, they may have no familiarity at all with the operations of the central bank. I must confess myself that I was an economist for 30 years, although not a specialist in money and banking, before I personally set foot within a central bank of any kind, and my knowledge of such banks and their operations are derived wholly from books and talk. Even in the mind of a professional economist, therefore, the central banks appear as abstractions and cannot be visualized as flesh and blood realities. Whether the central banks should try to enlighten the public and to dispel the mystery is a nice point. It may well be that their own legitimacy is best fostered by preserving a certain air of charismatic obscurity about their operations. Their officers might even take to wearing gowns and robes and their public pronouncements might be couched in even more mysterious and impressive language than they now use.

The concept of a central bank as a creator of artificial order and financial ritual has some interpretive power and should not

be dismissed lightly. One of the real problems of central banking policy is that at the heart of it there is a certain arbitrariness. The movements of the bank rate, the decision to change the asset structures, the changes in legal reserve ratios, and other instruments of central bank control have a certain Delphic quality about them. They emerge as the result of arguments that are not disclosed, and yet they have very powerful effects on the total system. Furthermore, the effects of these decisions are not always easy to trace, and the feedbacks of information are not easy to relate to particular decisions. Under these circumstances, the ritualizing of these decisions may be a very important aspect in their legitimation. One might even speculate on the value of ritualizing them more than is now the case. The decisions of a board, for instance, might be entrusted to a dramatically attired rider who would deliver them to the White House with the pounding of hooves and the flourish of trumpets!

We might conclude with a brief look at the possible threats to the legitimacy of the System. The fact that the System survived the Great Depression is a tribute to the remarkable stock of legitimacy that it possesses. The extent to which the Federal Reserve System contributed to the Great Depression is still somewhat a matter of controversy. It certainly cannot be blamed for the whole episode; nonetheless, a strong argument can be made that in this period the payoffs of the System for the society as a whole were strongly negative and that disastrous mistakes in policy were made. In the short run, however, as we have noticed, the payoffs of the System are only loosely related to its legitimacy and the other sources of legitimacy for the Federal Reserve System are quite strong—strong enough, indeed, to enable it to survive a

considerable decline in its payoffs to society. The only source of loss of legitimacy that seems even remotely on the horizon arises out of the sixth factor; that is, the alliances with other legitimacies. The Federal Reserve System is not allied at all with the legitimacies that derive from religion, from the family, from the arts, and from the more poetic, heroic, and evocative aspects of life. It is essentially and almost wholly an institution of exchange. Its inputs and outputs are exchangeables, and in itself exchange is too rational an institution to create much loyalty and affection and the kind of legitimacy that proceeds from these sources. I would argue indeed that an exchange institution should not try to derive legitimacy from these other sources, for if it does so it makes itself ridiculous. The Federal Reserve should certainly not try to become patron of the arts, an inspirer of heroism, or a producer of poetry. To attempt to do so would be like tying peacock feathers on a work horse, and the ridiculous incongruities that would result would lessen rather than enhance the legitimacy of the institution.

Insofar as the legitimacy of the central banks is enhanced by alliances, it is with the national state, and the national state alone. In these days the national state is so fantastically legitimate an institution that to suppose that its legitimacy might decline or even collapse seems almost absurd. Nevertheless, stranger things have happened. Particularly if the international system deteriorates much beyond its present deplorable condition, the payoffs of the international system for the human race will be so negative that the legitimacy of the national state as the essential and primary institution of the international system will itself be affected. It may be, indeed, that before many decades are up, if we live that long, the

national state itself will have to be “desacralized.” This, indeed, is what general and complete disarmament and stable peace would involve. To put the matter brutally, some time in the future it may seem as absurd to die for one’s country as it would be today to die for the Federal Reserve.

In the long run, therefore, we may see something very peculiar. The very commonplace and nonheroic aspects of the national state may save it, and the strong alliance that exists between central banks and governments may turn out to be a two-way street. At the moment, indeed, it is government that confers legitimacy on central banks to a considerable extent. It is not wholly inconceivable that in the future it will be the fact that the central bank is primarily an agency for human welfare and not for human destruction that will confer legitimacy on the government, as we make the subtle transition from the warfare state, which threatens to engulf us all in a common destruction, to the desacralized commonplace, unheroic welfare state, which

works simply for human betterment. In the long run I have a good deal of confidence that payoffs in terms of human welfare are the only ultimate and self-sustaining sources of legitimacy. Sacrifice, age, mystery, and ritual can fool some of the people some of the time. If, however, they are not associated with real payoffs, they will be found out. This, of course, does not answer the question that we raised earlier as to whether there is not some other form of social organization that has still higher payoffs and lower costs than the existing banking structure. It would be rash indeed to argue that we have exhausted the potential of social invention in this regard. I am fairly certain, however, that whatever mutation may supplant the existing system has not yet been made, but if the legitimacy of the system rests firmly on its payoffs then the social invention that will supplant it, if any, should be welcomed with joy rather than fear. It is only what I do not now mind calling the fraudulent legitimacies that fear competition.

SELECTIVE CREDIT CONTROL

Lester V. Chandler
Princeton University

Contents

Federal Reserve Discount Policy as an Instrument for Selective Credit Control	17
Other Bases for Selective Credit Controls	19
Some Further Observations on Discounting	20

SELECTIVE CREDIT CONTROL

FEDERAL RESERVE DISCOUNT POLICY AS AN INSTRUMENT FOR SELECTIVE CREDIT CONTROL

One strand of thought in the Federal Reserve Act and in the statements and actions of Federal Reserve officials through the years is that discount policy should be used, at least on occasion, to influence the uses to which credit will be put—that it should be an important instrument, if not the principal instrument, for selective credit control.

This entire idea requires rethinking. For purposes of argument, I shall concede that on occasion the Federal Reserve may wish to exercise some degree of selective control over the uses of credit, by types of borrower and/or by types of use to which the credit is put. Selective control may be attempted over (1) credit from all sources, (2) credit from all commercial banks, (3) credit from all member banks, or (4) credit from banks that are currently borrowing from the Federal Reserve. My thesis is that primary reliance on discount policy to achieve such results is likely to prove ineffective, or to have undesirable side effects, or both. I believe Federal Reserve history bears me out. If the Federal Reserve wishes to exercise selective credit controls, it should rely primarily on other more comprehensive controls.

To analyze this, consider some methods that have been used.

Attempt to encourage certain types of paper and to hold down interest costs on it

by giving it privileged access to the Federal Reserve Banks. This can, of course, be successful if the Reserve Banks stand passively ready to buy all of the paper presented at the posted buying rate with no onus on the sellers. For example, this worked in the late 1920's when the Federal Reserve was the willing residual buyer of acceptances. It would also work if the Federal Reserve stood ready to discount or lend on the paper with no quantitative limit and no onus on the borrower. The rate on the paper could be held low relative to other market rates. Note, however, that (1) the Federal Reserve loses control over the volume of its holdings of the paper, and it has to buy all of the supply that others are unwilling to hold at the Federal Reserve rate, and (2) it has no control over the types of credit created on the basis of the newly issued reserves.

Now alter the situation by imposing some sort of quantitative control over the volume of borrowing by individual banks. This might be a "tradition against continuous or excessive borrowing" or anything else that would make it impossible or disadvantageous to borrow fully on the basis of the "favored" type of paper. In this case it no longer follows that the favored type of paper will enjoy a lower market yield relative to other yields or that there will necessarily be a net increase in total demand for

the paper. To attract the marginal holder necessary to make demand equal to supply, the rate may have to be fully competitive with other market rates. And it still remains true that the Federal Reserve cannot control the types of credit created on the basis of the new reserves.

Make "undesirable" types of paper ineligible as a basis for borrowing at the Federal Reserve. This might indeed reduce the banks' demand for this type of paper if they did not hold "eligible" paper of other types sufficient to cover likely needs for borrowing at the Federal Reserve or to cover the quantities the Federal Reserve would be willing to lend, whichever is smaller. But if banks have plenty of eligible paper, their willingness to acquire ineligible paper will be little reduced by its ineligibility.

Deny the discounting privilege to banks that hold "undesirable types of paper" or too much of it. The classic case occurred in 1929, when the Federal Reserve wished simultaneously to curb "speculative security loans" and to maintain reasonable rates for "legitimate business." The technique attempted was to deny, or at least limit, Federal Reserve loans to banks with speculative securities loans. Note that this did not affect at all the broad classes of lenders: all nonbank lenders, nonmember banks, and member banks that were not in debt to the Federal Reserve and expected that they would not need to borrow. This narrow coverage was enough to doom the experiment. It probably did restrict somewhat such loans by member banks that were borrowing at the Federal Reserve or who feared they might have to do so. But the restrictive effects on such banks were not nearly so selective as the Federal Reserve had hoped. Such banks had several ways of getting out of debt to the Federal Reserve or of avoiding borrowing there, while maintaining speculative loans on se-

curities. (1) They bid the Federal funds rate considerably above the discount rate. (2) They sold acceptances, Government securities, and other open market assets extensively. (3) They sold mortgages or refrained from buying them. (4) They even went so far as to limit loans to business customers.

In short, the whole attempt was a failure. Loans on securities continued to rise up to the eve of the crash and the restrictive effects were not selective; credit of all kinds to all kinds of users was restricted. Governor Harrison, of the New York Reserve Bank, later claimed that this whole "moral suasion" effort aimed only at borrowing members made banks less willing to borrow at the Federal Reserve in the early 1930's. Whether or not this is true, it is plausible.

Not only this case but also other evidence and a priori reasoning lead me to the conclusion that it is unwise to rely primarily, or even heavily, on discounting policy as an instrument for selective credit control. When this is done, the offense is not that of making "undesirable" types of loans; it is that of making or holding such types of loans by banks in debt to the Federal Reserve. Banks and others not in debt to the Federal Reserve can make such loans without restriction or onus. Moral: stay out of debt to the Federal Reserve and thus maintain freedom of action. I believe that the effects of such policies, if resorted to frequently, would be to:

1. Inhibit use of the Federal Reserve discount window and militate against the development of discounting. Reluctance to borrow would be augmented by "reluctance to become subject to Federal Reserve selective controls." Banks, especially the larger ones, would develop even further their capacity to "stay out of the Federal Reserve" through Federal funds, CD's, re-

purchase agreements, and other financial arrangements.

2. Penalize the wrong thing; that is, borrowing at the Federal Reserve rather than making "undesirable loans." Presumably the prime purpose of selective controls is to regulate the making of undesirable loans. To penalize borrowing at the Federal Reserve is a clumsy, ineffective, and inequitable way of trying to inhibit banks from making undesirable loans.

3. Lead to an inefficient allocation of credit. Consider, for example, an attempt to limit business loans by controlling access to the discount window. Is there any reason to believe that the most efficient allocation of credit would require the smallest expansion by those banks that, for one reason or another—such as deposit drains or inability to attract CD money—were borrowing at the Federal Reserve, or feared they would have to?

OTHER BASES FOR SELECTIVE CREDIT CONTROLS

As indicated earlier, I believe that selective credit controls, if they are to be used, should be based upon Federal Reserve powers broader than the power to discount and applied more widely than to member banks who are in debt to the Federal Reserve or fear that they soon may be. Ideally, such controls should have at least the following characteristics:

They should apply to all lenders, or at least to all potentially important lenders, in the market involved. They should not discriminate against banks borrowing at the Federal Reserve, or member banks, or commercial banks. In some cases it may be enough for the regulations to cover only commercial banks; in other cases they should apply more widely.

They should be based upon the social desirability of controlling selectively the type of credit involved and justified on the basis of Federal Reserve responsibility to exercise such controls, rather than on its power to discount.

They should be implemented with measures appropriate to the selective ends being sought. I do not pretend to know what these measures should be. However, some possibilities may be suggested, at least some of which would require permissive

legislation. (Some readers may be shocked by the degree of selective intervention implied. But can selective controls be expected to work otherwise?)

- (1) Margin or downpayment requirements. (Implies knowledge of true values.)
- (2) Maximum periods of repayment.
- (3) Differential reserve requirements against various types of assets, or differential marginal reserve requirements against increases in various types of assets above some base.
- (4) Quantitative limitations on increases of selected types of assets above some base date; that is, not more than 5 per cent above the level at the end of 1966.
- (5) Limitations on selected types of assets as a percentage of total assets, or total deposits, or net worth, or some other base.
- (6) Limitations of changes of selected types of assets as a percentage of changes in total assets, or total deposits, and so forth.
- (7) Methods of encouraging banks to hold or even to increase their holdings of selected assets:

- (a) Secondary reserve requirements in the form of the favored types of assets equal to at least a stated percentage of deposits or of assets other than cash.
- (b) Marginal secondary reserve requirements calling for increase of favored assets equal to at least some percentage of increase of other earning assets. This, and variations of it, offer interesting possibilities and problems.
- (c) Permit banks, in computing required reserves, to deduct from their deposits (demand or time) all or a fraction of their holdings of the favored assets. (This percentage need not be the same as the percentage reserve requirement for the bank.)

Those who are more ingenious can think of other possibilities. The types of measures suggested above, and modifications of them, could be used in various combinations. Just one imaginary example. Consider the case in 1966 when the Federal Reserve wished

to discourage both the expansion of business loans and bank liquidation of certain favored assets. It might (given the legal power) have proclaimed the following: "Until further notice, the required reserves of any bank will be equal to its regular required reserves against deposits plus an amount equal to 10 per cent of (the change of its business loans over a specified base date *minus* the change of its holdings of favored assets over the same specified base date)." Consider three cases in which a bank increases its business loans by \$100.

1. It increases its holdings of favored assets by the same amount. It has no required reserves against assets.

2. It holds constant its holdings of favored assets. It has required reserves against assets of \$10.

3. It decreases by \$100 its holdings of favored assets. It has required reserves against assets of \$20.

Of course, this would encourage banks to try to borrow rather than sell favored assets. So, if you wish, you can impose a reserve requirement on all bank liabilities, including outstanding repurchase agreements.

This is one principle; you work out the details!

SOME FURTHER OBSERVATIONS ON DISCOUNTING

Here are a few brief comments on lessons from the 1920's and early 1930's.

As I have indicated earlier, I believe bank willingness to borrow from the Federal Reserve and to remain in debt to it, as well as bank demand for excess reserves, fluctuate in a procyclical manner, even when cycles are mild. One reason is the wide fluctuations of customer demands for loans. Another is that banks share the euphoria of boom and the hesitancy of recession. A

third is that banks want to retire debt and build up liquid assets in depression because they fear less liquidity will be provided by net flows of funds to them. The moral of this, as many have pointed out, is that outstanding discounts should be liquidated through open market purchases at the onset of recession. This should be obvious but was not to most Federal Reserve officials in 1930 and 1931.

Discounting does not appear to be a very

effective device for supplying additional funds to credit-scarce areas over a prolonged period. In the 1920's this was tried; country banks in some cases were encouraged to borrow, agricultural paper of longer maturity was made eligible for rediscount, and the Federal intermediate credit system was created. But the results seem to have been rather limited. The reasons for this were probably numerous, but important were the facts that banks had to

endorse the paper and bear the risk, that they had in many cases too little capital to make this a sound practice, and that many banks lacked the inclination to extend themselves.

As I read the lesson, success in remedying credit scarcity over a prolonged period requires credit institutions that can bypass the banks and put credit in the hands of ultimate users. Admittedly, however, "success" is a relative term.

A REVIEW OF RECENT ACADEMIC LITERATURE ON THE DISCOUNT MECHANISM

David M. Jones

Federal Reserve Bank of New York

Contents

Introduction	25
Major Issues and Related Findings	25
Borrowing and monetary restraint	
Determinants of member bank borrowing	
Nonprice rationing	
Announcement effects	
Proposals for change	
Concluding observations	
Discounting and Monetary Control	29
Borrowing and monetary restraint	
Determinants of member bank borrowing	
Nonprice rationing	
Announcement effects	
Proposed Changes in the Discount Mechanism	37
Abolition of discount mechanism	
Nondiscretionary approach	
Discretionary approach	
Tobin's proposals	
Bibliography	42

A REVIEW OF RECENT ACADEMIC LITERATURE ON THE DISCOUNT MECHANISM

INTRODUCTION

After approximately two decades of disuse, the Treasury–Federal Reserve accord of 1951 prompted renewed interest in the nature and effectiveness of the discount mechanism. Analysis since the accord has been devoted in large part to the unresolved controversy over the nature of the relationship between discounting and monetary control.

This paper discusses only the post-accord academic literature that bears directly on the implications of discounting for monetary control. Special emphasis will be placed on the determinants of member bank borrowing, including a review of the major issues and related empirical findings. The responsiveness of borrowing to movements

in interest rates is of particular concern in this regard. An effort will also be made to cover in some detail the wide range of proposed changes in the current discounting arrangement.

The primary intent of this paper is to present the post-accord literature on discounting in such a way as to highlight the major points of emphasis in recent analysis. Hopefully, information of this type can serve as important background material for a reconsideration of the role of the Federal Reserve discount mechanism. The paper does not attempt to make an assessment of the affirmative and negative sides of the many technical issues that are raised in the academic literature.

MAJOR ISSUES AND RELATED FINDINGS

The fundamental issue raised by post-accord literature dealing with the Federal Reserve discount mechanism is whether this mechanism operates to subvert or to supplement over-all monetary control. Critics have argued that the discount function as it currently operates is fundamentally antagonistic to monetary management. Related to this position, issues have developed around a number of topics, namely: (1) the effects of borrowing during periods of restraint; (2) the factors that determine

borrowing; (3) the significance of nonprice rationing; and (4) the announcement effects of changes in the discount rate.

Borrowing and monetary restraint

On one hand, the discount mechanism may be viewed as a sort of “safety valve” that cushions but does not offset the usually uneven impact on individual banks of restrictive shifts in monetary policy. Temporary reserves are allocated through the discount window directly to those banks com-

ing under greatest stress, and thus the System is free to act more decisively than otherwise would be the case.

The case favoring the present discounting arrangement turns on the contention that reserves supplied through the discount window are by nature more restrictive in terms of credit and deposit expansion than reserves supplied through other means. Borrowing from the Federal Reserve is looked upon as only a temporary source of funds for the individual bank, usually requiring some form of asset adjustment in order to effect prompt repayment. Thus, the larger the over-all volume of borrowing relative to other sources of reserves, the greater the restrictive impact on credit growth.

The academic critics of the existing discount mechanism have not sought to refute directly the points raised above. Their position is founded instead upon the following three general considerations:

1. The initiative in using the discount mechanism rests with the borrowing banks themselves rather than with those charged with the responsibility for monetary control.

2. Member bank borrowing from the Federal Reserve adds to total reserves, whereas sales of Treasury bills or other means of reserve adjustment available to the banks do not.

3. Member bank borrowing tends to rise during periods of monetary restraint and fall during periods of monetary ease.

In essence, the critics hold that over-all monetary control is weakened to the extent that discounting counters the impact of Federal Reserve open market operations on the reserve base. Working in the context of models linking bank reserves to the money supply, and the money supply to economic activity, some economists have argued that borrowing accentuates cyclical swings.

Determinants of member bank borrowing

Inasmuch as discounting is at the banks' own initiative and, therefore, difficult to predict, post-accord inquiry has focused on the determinants of member bank demand for borrowed reserves. To what extent are banks' decisions to borrow influenced by profitability considerations? And how strong is the so-called "tradition against borrowing"? These questions are remnants of the old need versus profitability issue, which was debated at length in the 1920's and 1930's.¹

The "need" concept has never been clearly defined by its advocates, but according to common interpretation banks that borrow out of "need" do so only to meet temporary, unexpected reserve deficiencies. At the same time, the needy banks supposedly make every effort to repay these debts as soon as possible. This view of borrowing behavior presumes a strong traditional reluctance on the part of banks to be in debt to the Federal Reserve.

On the other hand, the strict version of the "profitability" thesis posits that banks will borrow whenever additional funds can be invested in assets that earn yields higher than the discount rate. In short, banks borrow out of a calculated effort to profit from rate differentials, rather than simply in response to the unpredictable swings in market factors that produce temporary reserve deficits.

Expressed in these terms, "need" and "profitability" appear to be conflicting mo-

¹ See, for example, W. Randolph Burgess, *The Reserve Banks and the Money Market*; Lauchlin Currie, *The Supply and Control of Money in the United States*; Charles O. Hardy, *Credit Policies of the Federal Reserve System*; Seymour E. Harris, *Twenty Years of Federal Reserve Policy*; Winfield W. Riefler, *Money Rates and Money Markets in the United States*; and Robert C. Turner, *Member Bank Borrowing*. For an excellent discussion of the points raised in these earlier writings, see A. James Meigs, *Free Reserves and the Money Supply*, pp. 6-31.

tives. In effect, the borrowing-out-of-“need” proponents postulated that such borrowing was insensitive to levels of interest rates, while the “profitability” school visualized that borrowing was affected by rate levels.

One of the few important contributions of the post-accord literature on discounting has been the theoretical resolution of the need versus profitability issue. But even this accomplishment rests in large part on a modified concept of profitability that dates back to Turner’s work in the 1930’s. The argument runs roughly as follows: Given a reserve deficiency or the need to borrow—whether the cause is an unexpected surge in required reserves, or a sudden cash drain, or some other reserve-absorbing factor—the extent to which a bank makes use of the discount window for its reserve adjustments depends upon the relative costs of borrowing and of other means of replenishing reserves. For example, the higher the Treasury bill rate—that is, the larger the loss of revenue from reducing the bill portfolio—relative to the discount rate, the less the relative cost of borrowing (or the greater the profitability) to meet a given reserve deficit. Thus, a reluctant bank that borrows only to meet its immediate needs can, at the same time, be sensitive to the rate differentials between its alternative sources of short-term funds. By using this modified concept of profitability, it has been demonstrated with some rigor that it is possible to integrate, into a consistent theory, bank reluctance to be in debt to the Federal Reserve and the profit incentive for such borrowing.

During periods of monetary restraint, the discount rate tends to lag behind rising market rates on alternative sources of funds, and borrowings rise. Conversely, the discount rate remains above falling market rates on the same sources of funds during

periods of monetary ease, and borrowings fall. This fact represents one basis of the contention that borrowings tend to accentuate cyclical swings.

Nonprice rationing

The attitude of banks toward the nonprice terms applied at the discount window has an important bearing on their decisions to borrow. Yet it appears that the Reserve Banks find it quite difficult to administer these terms. A wide variation in nonprice terms, among the various Federal Reserve districts and/or over time, can serve to diminish significantly the predictability of borrowings. It is difficult, if not impossible, to separate—and measure in relative terms—the effects of nonprice rationing from the effects of bank reluctance to borrow. It has been argued that these two factors have a mutually reinforcing effect on bank borrowing. But there has been very little in the literature on this subject. In general, there seems to be a dissatisfaction with nonprice rationing, explicitly on the grounds that the price mechanism would operate more effectively.

Announcement effects

A major source of contention in the literature has been the question of whether discretionary changes in the discount rate have undesirable effects on expectations. On the one hand, it is argued that one must make inconsistent assumptions about the behavior of lenders and borrowers in order for the announcement feature of discount rate changes to have desired effects. It has also been argued that, at best, the announcement effects will be unpredictable.

There are, however, those who see some merit in announcement effects. They argue that discretionary changes in the discount rate have two basic advantages. First, the

changes are widely publicized and especially useful as a universal means of signaling the intent, for example, to stem a balance of payments drain. Second, discount rate adjustments, the only major monetary instrument that has no direct effect on reserves, can play a unique and often helpful role as an index of the course of policy.

Proposals for change

Proposals for changing the discount mechanism have run the gamut from abolishing the mechanism altogether to allegedly making it the most powerful tool of monetary policy. Elimination of the discretionary aspect of discount-window administration is the object of nearly all of the proposed modifications.

A plan often suggested would eliminate discretionary discount rate changes by tying the discount rate to the market rate on some alternative source of ready funds. This type of arrangement usually involves setting the discount rate high enough above the anchor rate to make it a "penalty" rate. Most advocates of such a device would rely on the price mechanism alone to allocate Federal Reserve credit and to keep borrowing in check; they would, in effect, discard the present borrowing "privilege" with its non-price connotations in favor of granting banks the "right" to borrow. There has been controversy, however, on the appropriate market rate to which the discount rate would be anchored.

A somewhat more radical plan calls for the payment of interest at the discount rate on member banks' excess reserves. Through adjustments in the discount rate, the Federal Reserve would then have direct control over the opportunity cost of bank lending. Under such an arrangement, banks would be tempted to increase their excess reserves and reduce their holdings of short-

term Government securities. The discount rate would then take on sharply increased importance among the major instruments of monetary policy.

There are, in addition, those who would abolish the discount mechanism. Two reasons for such a move have been advanced. First, by doing away with borrowing at the banks' initiative, the Federal Reserve would greatly improve its control over total reserves. Second, it has been argued that the discounting function is no longer necessary in view of the substantial postwar growth in banks' holdings of short-term Government securities, which can be used to make the necessary adjustments in reserve positions. Needless to say, the latter argument has little relevance under circumstances in which bank holdings of short-term Government securities are minimal.

It has also been proposed, however, that the discounting terms should be fully discretionary. The basic contention is that the discretionary approach not only entails the power to control total borrowing but also makes possible the selective control of bank lending practices.

Concluding observations

Although most of the major issues raised in the academic dialogue on discounting remain unresolved, it is possible to draw some general conclusions. Discounting does not, for example, appear to weaken monetary control to any significant extent during periods of monetary restraint. Indeed, the discount mechanism is, for the most part, a useful complement to open market operations. Those favoring the current arrangement argue, in particular, that shifts in monetary policy are cushioned by the provision of temporary reserves through the discount window to those banks that suffer the greatest stress. At the same time, bor-

rowed reserves have less expansive implications for credit and deposit growth than a corresponding amount of reserves supplied through other means.

On the other hand, regardless of how limiting the effect of borrowed reserves on credit growth may be, the fact remains that monetary control is rendered less precise under conditions in which banks borrow at their own initiative. Hopefully, the predictability of borrowing can be improved by reliable quantitative measurements of the relative effects of interest rates and other factors that influence banks' decisions to borrow.

With regard to administration of the discount window and general supply considerations, there is almost unanimous agreement among economists on the desirability of complete reliance on the price mechanism to control borrowing. But regardless of how appealing the "tied" rate plans may be, there has been no agreement on the market rate to which the discount rate

should be linked nor on the appropriate spread to be maintained. Although experience suggests that there should be some substantial revisions in the present nonprice discounting guidelines, it seems that both price and nonprice terms will continue to be necessary to insure effective monetary control.

Finally, the predominant view in the literature is that under present circumstances the announcement effects of changes in the discount rate will be ambiguous at best. At the same time, those who fear that changes in the rate will have adverse effects on expectations may have overrated their case a bit. In particular, it is not likely that discount rate changes alone, whatever their effects on expectations may be, dominate the behavior of borrowers and lenders. Indeed, these rate adjustments are only one of many factors that influence expectations about the course of monetary policy and future economic conditions.

DISCOUNTING AND MONETARY CONTROL

Borrowing and monetary restraint

As noted earlier, those favoring the current discount procedures often assume that borrowed reserves are less expansive in terms of credit growth than a corresponding amount of reserves provided through open market operations.² It is argued that banks will seek to extinguish their borrowed reserves promptly, usually through some form of asset adjustment. In Roosa's words:³

² See, for example, Board of Governors of the Federal Reserve System and the U.S. Treasury, *The Federal Reserve and the Treasury: Answers to Questions from the Commission on Money and Credit*, p. 118.

³ Robert V. Roosa, "Credit Policy at the Discount Window: Comment," p. 334.

In the American setting the fact that banks borrow only as a privilege means that even though any individual bank can temporarily, in effect, cause the creation of reserves by borrowing at the discount window, that same bank simultaneously takes on an obligation to find ways of extinguishing those reserves—the more promptly the better, in order to preserve its privilege for use again when unexpected reserve drains occur. Thus, as a general rule, the larger the aggregate volume of bank borrowing from the Federal Reserve, the greater will be the effort going on, through the banking system, to limit credits and bring reserves into balance with the requirements against deposits.

The fact that Roosa casts his discussion in terms of the actions of an individual bank is not to deny that a high or rising volume of borrowings for the banking sys-

tem as a whole may persist for long periods—as for example, when an increasing number of banks turn to the discount window for temporary reserve relief. But the key point is that aggregate borrowed reserves have a restrictive impact on credit expansion; and the higher the level of such borrowing, the greater the restriction involved.

Apart from the special nature of borrowed reserves, Samuelson has argued that the tendency for borrowings to offset in part the reserve effects of open market operations actually strengthens monetary policy. He observes that:⁴

While it is true that discounting often acts counter to open-market operations, there is no evidence that a unit change in open-market operations induces an opposing change in discounting large enough to reverse or substantially wipe out the original effect. So it is not really difficult for the planners of open-market operations to take all this into account; and precisely because they know that the discount window provides an escape valve, they can be more courageous in the use of open-market operations.

Among the critics of the present discounting arrangement, Milton Friedman looks upon borrowing with somewhat more alarm. He contends that since the banks can discount at their own initiative, the System is unable to exert direct control over monetary expansion.⁵

Warren Smith, another academic critic of the current discount mechanism, asserts that those who emphasize the restrictive nature of borrowed reserves overlook the all-important fact that member bank borrowing adds to total reserves. “Therefore . . . borrowing constitutes an offset to the restraint that brought it about to the extent

that the supply of reserves is thereby increased.”⁶

Finally, the procyclical fluctuations in borrowings have been criticized by Aschheim⁷ and Brunner and Meltzer⁸ among others. In this regard, Aschheim observes that “. . . however strong the commercial bank tradition and however potent the Federal Reserve policy, they have not stood in the way of cyclical fluctuations in the volume of rediscounting.”⁹ Brunner and Meltzer go into somewhat more detail on this matter:¹⁰

The administration of the discount window contributed both in the twenties and the fifties to the cyclical variability of the money supply. The discount rate typically lags behind the movements of the market rates. A cyclical upswing, generated or reinforced by nonmonetary factors, pushes market rates ahead of the discount rate, and induces banks to expand their borrowing. The rising volume of discounts and advances increases the [reserve] base and consequently increases the money supply. A reverse operation occurs in a downswing. The cyclical variability of the money supply is thus amplified by the operation of the discount window.

Determinants of member bank borrowing

Most of the post-accord dialogue on the factors that influence banks in their decisions to borrow has been conditioned by the need versus profitability issue that was debated extensively in the 1920's and 1930's. Recent attempts have been made to isolate and quantify the impact of interest rates on borrowing, and general comments on the

⁴ Paul A. Samuelson, “Reflections on Monetary Policy,” p. 266.

⁵ Milton Friedman, *A Program for Monetary Stability*, p. 38.

⁶ Warren L. Smith, “The Discount Rate as a Credit Control Weapon,” p. 172.

⁷ Joseph Aschheim, *Techniques of Monetary Control*.

⁸ U.S. House of Representatives, Subcommittee on Domestic Finance, *An Alternative Approach to the Monetary Mechanism*.

⁹ Aschheim, *op. cit.*, p. 91.

¹⁰ U.S. House of Representatives, Subcommittee on Domestic Finance, *op. cit.*, p. 35.

sensitivity of borrowing to rate movements are abundant in the literature. Somewhat less attention has been devoted to the question of bank reluctance to borrow. One of the more interesting contributions in the post-agreement literature is a theoretical reconciliation of these two motives.

Interest rates and borrowing. Many of those who feel that the present discount mechanism weakens monetary control are alarmed by evidence suggesting that borrowings are sensitive to interest rates and that they therefore work systematically against open market operations. Although the extent to which borrowings respond to rate movements is clearly an empirical question, the evidence is scanty. Typical of the casual observation in this area is the following: "No doubt it is true that banks are reluctant to borrow, but like many ordinary persons, bankers allow their reluctance to be overcome by more attractive alternatives."¹¹ Aschheim theorizes in a similar vein:¹²

The Federal Reserve prefers to state that in time of monetary tightness there is a great "need" on the part of member banks for rediscounting. Economically, the more informative formulation, however, is that in times of monetary tightness it is more profitable for banks to borrow from the Federal Reserve than in other periods.

Warren Smith is somewhat more specific about the way in which he feels that interest rates influence borrowing decisions, but he too stays primarily in the realm of supposition in observing that while bank demand for readily available funds to satisfy the kind of urgent needs that commonly induce banks to borrow at the discount window is probably quite interest-insensitive, the extent to which banks actually turn to the Federal Reserve to satisfy these needs

rather than relying on other sources may be significantly affected by rate movement:¹³

In most cases, banks have a choice of obtaining additional funds by borrowing at the Federal Reserve or by liquidating secondary reserves or other investment securities. Surely, the major factor influencing the choice will be the relevant cost of funds obtained by the various methods, and this depends chiefly on the relation between the discount rate and the expected yield on assets that the bank may consider liquidating.

Meigs, who actually focuses on bank demand for free reserves (excess reserves less borrowing), concludes that "aggregate member bank borrowing is indeed influenced by the net yields obtainable on borrowed funds, within a considerable part of the range of interest rates and other conditions observed."¹⁴ In this connection Meigs makes the point that the hypothesis that member bank borrowing is not responsive to changes in market interest rates cannot be confirmed solely by demonstrating that banks are reluctant to borrow. Rather, the characteristics of the demand schedule must be determined by direct empirical observation of borrowing and interest rates.

More recently, de Leeuw has concluded from empirical estimates of bank demand for borrowed reserves (based on quarterly data for the 1954-62 period) that the response of borrowings to the differential between the discount rate and the yield on 3-month Treasury bills is "moderate," with implied long-run elasticities with respect to the discount rate and the yield on Treasury bills of -0.7 and $+0.5$, respectively.¹⁵ de Leeuw uses a stock-adjustment formulation of the borrowings demand function in deriving these results. According to the

¹³ Smith, *op. cit.*, p. 172.

¹⁴ Meigs, *op. cit.*, p. 89.

¹⁵ Frank de Leeuw, "A Model of Financial Behavior," pp. 512 and 513.

¹¹ Earl Rolph, "Discussion," pp. 413 and 414.

¹² Aschheim, *op. cit.*, p. 91.

stock-adjustment principle, changes in bank borrowings in any given period are a function of the discrepancy between the desired level of borrowings in that period and the actual level of borrowings in the preceding period. de Leeuw posits that desired amounts of borrowing are dependent, in turn, upon (1) the differential between the Treasury bill rate and the discount rate, (2) the Treasury bill rate level, and (3) the net inflow of bank funds (that is, changes in private demand deposits plus Federal Government demand deposits plus private time deposits less member bank required reserves less holdings of loans and other private securities).

In an empirical study patterned closely after de Leeuw's work, Stephen Goldfeld has estimated borrowing demand functions for city and country banks, separately.¹⁶ He found the short-run elasticity of changes in borrowings with respect to the discount rate to be -0.875 for country banks and -0.979 for city banks. Comparable elasticities with respect to the Treasury bill rate were $+0.785$ and $+0.877$ for country and city banks, respectively. Goldfeld's long-run elasticity estimates for these variables were substantially higher than de Leeuw's and, surprisingly, were higher for country banks than for city banks. Specifically, the estimates of long-run elasticity of borrowings with respect to the discount rate were -2.926 and -2.382 for country and

city banks, respectively. The Treasury bill rate elasticities were $+2.625$ for country banks and $+2.134$ for city banks.

In yet another empirical study, Goldfeld and Kane have gone still further by deriving estimates of demand for borrowings for four separate classes of member banks.¹⁷ Another distinguishing feature of this study is that the empirical demand estimates are based on *weekly* data for borrowings. From a demand function that relates borrowings to the Treasury bill–discount rate differential, lagged borrowings, and changes in non-borrowed reserves, Goldfeld and Kane calculated implicit short-run elasticities with respect to the bill rate of 0.56 for New York City banks, 0.08 for Chicago banks, 0.15 for other reserve city banks, 0.21 for country banks, and similarly, 0.21 for total member banks. Goldfeld and Kane note that the long-run elasticity of borrowings with respect to the Treasury bill rate ranged from 2.8 to 3.9 for the various groups of member banks and that such figures are thus generally consistent with Goldfeld's quarterly results. (Comparable elasticity estimates for the discount rate were not presented in this article.)

The Federal Reserve System has not always been completely clear on the importance it attributes to interest rate considerations in the decisions of banks to borrow. The following is among its pronouncements on the subject:¹⁸

Banks are generally reluctant to become indebted to the Federal Reserve except for very short periods, and when in debt feel constrained to liquidate assets. The deterrents to borrowing

¹⁶ Stephen M. Goldfeld, *Commercial Bank Behavior and Economic Activity*. Goldfeld's short-run elasticities were calculated by $\frac{\partial(\Delta B)}{\partial r} \cdot \frac{\bar{r}}{\bar{B}}$ where B represents bank borrowing and r is the relevant interest rate. Note that the relevant mean used was that of the *level* of borrowing, \bar{B} . The mean of the flow variable cannot be used because it could well be zero in some cases. The long-run elasticities were obtained by setting the borrowings flow, ΔB , equal to zero, solving for the steady-state B , and differentiating as above.

¹⁷ Stephen M. Goldfeld and Edward J. Kane, "The Determinants of Member Bank Borrowing: An Econometric Study."

¹⁸ U.S. Congress, Joint Economic Committee, *Employment Growth and Price Levels, Hearings*, p. 755.

are greatly weakened if market yields on securities owned become and remain substantially higher than the discount rate.

Going into greater detail on the relationship among borrowings, market rates, and the discount rate under conditions of monetary restraint, the System has commented that:¹⁹

. . . it is of prime importance that the general reluctance of banks to borrow at the Federal Reserve be reinforced by a discount rate with real deterrent power at times when a tempering of bank credit growth is in the public interest. In other words, in order to make the discount mechanism an effective supplement to open market operations the Federal Reserve is obliged to maintain discount rates not markedly lower than market yields on the most readily available alternative source of bank reserves, Treasury bills. If the Federal Reserve in these circumstances did not adjust its discount rates to keep them "in touch" with market rates, the task of administering the discount window to prevent excessive credit expansion would become very difficult.

On the other hand, the System has more recently concluded that a comparison of the costs of alternative sources of ready funds with changing amounts of borrowed funds "does not suggest that there is a powerful borrowing response to changing cost considerations."²⁰

Reluctance to borrow. Attempts to discern the nature of the tradition against borrowing date back to the need versus profitability discussions of the 1920's. Bank reluctance to borrow is commonly associated with the notion that since banks are already "in debt" to their depositors, with repayment due in many cases on demand, it is imprudent for them to incur additional debt that is of a prior-claim nature.²¹ Continued borrowing has been viewed as a con-

fession either of weakened condition or of poor management.²² There is general agreement that the reluctance to borrow varies markedly in intensity among banks. Nevertheless, it has been argued that "in most cases" bank reluctance to borrow is "a deterrent sufficiently strong to prevent excessive use of discounting."²³

At first glance, one might readily interpret any premium in excess of the discount rate that banks pay for Federal funds as a manifestation of bank reluctance to borrow from the Federal Reserve. In fact, however, large banks, which are the ones primarily responsible for bidding up the Federal funds rate, are almost certainly not insensitive to rates in a way that the traditional meaning of reluctance would imply. Rather, these banks may be viewed as adding an implicit cost factor to the discount rate in order to take account of scrutiny by the discount authorities. Under such circumstances, the effective cost of borrowing to these large banks will exceed the published discount rate, and the Federal funds premium may be largely illusory.

Theoretical reconciliation. Polakoff has demonstrated that it is possible to integrate into a consistent theory bank reluctance to be in debt to the Federal Reserve and the profit incentive for such borrowing.²⁴ The key assumption in Polakoff's theory is that member banks display a "reluctance elasticity" when borrowing from the Federal Reserve; in other words, it is true not only that there is a reluctance to borrow at all times but also that this reluctance increases

¹⁹ *Ibid.*, p. 756.

²⁰ Board of Governors of the Federal Reserve System and the U.S. Treasury, *op. cit.*, p. 134.

²¹ *Ibid.*, p. 129.

²² Charles R. Whittlesey, "Credit Policy at the Discount Window," p. 213.

²³ Board of Governors of the Federal Reserve System and the U.S. Treasury, *op. cit.*, p. 130.

²⁴ Murray E. Polakoff, "Reluctance Elasticity, Least Cost, and Member Bank Borrowing: A Suggested Integration."

as the volume of discounting grows. Viewing member bank decisions to borrow in the context of a "preference" system, Polakoff reasons that as borrowings rise in response to an increasing differential between the yield on Treasury bills and the discount rate, the disutility of borrowing relative to the utility of profit will eventually become so great that member banks will no longer borrow. He argues, in effect, that the banks' marginal propensity to borrow declines as the spread between the bill and the discount rates widens.

To test his hypothesis, Polakoff relates (in scatter diagrams) both weekly and monthly data on member bank borrowings to specific spreads between the bill and discount rates over the July 1953 to December 1958 period. He concludes that "the expansion paths of borrowings suggested by the various scatter diagrams are *all* consistent with the theoretical results deduced from the integration hypothesis."²⁵ However, these empirical findings are not supported by Goldfeld's results from quarterly data for the somewhat longer period, 1950-III to 1962-II. Taking account of the impact of loan demand and reserve availability on borrowing behavior (something Polakoff failed to do) Goldfeld tests specifically for the relationship between borrowings and the rate spread postulated by Polakoff. He finds that while borrowings are in general interest-sensitive, there is no tendency for the marginal propensity to borrow to fall as the rate differential widens.²⁶

²⁵ *Ibid.*, p. 18. In a more recent article, Polakoff has fitted a quadratic function to his empirical data and offered this as further proof of his theoretical scheme. See Murray E. Polakoff, "Federal Reserve Discount Policy and Its Critics," pp. 205-07.

²⁶ Goldfeld, *op. cit.*, pp. 150 and 151. In their more recent test using weekly data covering the July 1953 to December 1963 period, Goldfeld and Kane

Nonprice rationing

The guiding principles of Regulation A (as amended in 1955) have been interpreted and applied only with considerable difficulty. The appropriateness of borrowing under these nonprice terms turns on the intent of the borrower. A bank is not, for example, to borrow willfully in order to make a profit from rate differentials. But this is basically a subjective determination, and it is difficult, if not impossible, to pinpoint the uses to which borrowed reserves are put.

Distinctions between appropriate and inappropriate borrowing may be quite fine, as evidenced by the following case cited by a former Federal Reserve discount officer:²⁷

. . . if a bank borrowed temporarily to meet a commitment to make a loan to a business concern at 4 per cent, with reasonable expectations of having funds at hand shortly to pay out, the bank would not be borrowing to earn a rate differential even though it was borrowing at the lower rate (in one market) and re-lending at a higher rate (in another market).

With regard to the stability of discounting terms over time, Professor Whittlesey has set out to correct what he terms a "common misconception" that nonprice discount window standards are adjusted to changing business conditions. According to

came up with what they consider to be "limited support" for the relationship between borrowings and rates hypothesized by Polakoff. See Goldfeld and Kane, *op. cit.*, p. 513. The evidence offered by Goldfeld and Kane in support of the Polakoff hypothesis has recently been brought into question by Polakoff and Silber in "Reluctance and Member-Bank Borrowing: Additional Evidence." Polakoff and Silber argue that high collinearity in Goldfeld and Kane's observations bearing on Polakoff's hypothesis "sheds serious doubt on the validity of these results." In place of Goldfeld and Kane's analysis, Polakoff and Silber present their own evidence, which is interpreted as verifying the operation of the "reluctance/surveillance" motive in periods of "tight" money.

²⁷ George W. McKinney, Jr., *The Federal Reserve Discount Window*, pp. 106 and 107.

Whittlesey, "the fact is that neither the way in which the discount window is administered nor the standards by which member bank borrowing is judged are modified to conform to over-all monetary policy."²⁸ Roosa is of a similar opinion:²⁹

Insofar as human frailties permit, it is always the same [discount] window, open in the same way at all times for borrowers of the same circumstances. What makes the impact of these continuous standards seem to vary is that the circumstances of the banks themselves change.

The relative importance of discount-window administration and the tradition against borrowing in borrowing decisions has been a point of contention. Professor Whittlesey argues, for example, that the administration of the discount window is not a significant feature of over-all credit control but that it merely acts in an indirect and admonitory manner ". . . to keep alive and reinforce the tradition against borrowing, without which discount policy as presently conducted could quickly break down."³⁰ According to Whittlesey, ". . . the privilege of borrowing, despite conventional statements to the contrary, is, in practice, tantamount to a right."³¹

Roosa, for one, does not appear to be convinced that discount-window administration does in fact play such an unimportant role in borrowing decisions. Without attempting to determine precisely where the influence of discount-window surveillance begins and the influence of the traditional reluctance to borrow runs out, he contends that "both are certainly present; and whenever the check imposed by tradition might begin to falter, the limits imposed by surveillance would begin to take hold."³²

²⁸ Whittlesey, *op. cit.*, p. 209

²⁹ Roosa, *op. cit.*, p. 334.

³⁰ Whittlesey, *op. cit.*, p. 216.

³¹ *Ibid.*, pp. 214 and 215.

³² Roosa, *op. cit.*, p. 336.

Finally, the difficulties in administering the provisions of Regulation A may have contributed to variations in nonprice terms among Federal Reserve districts. This is contended in a recent study of the relationship between borrowed reserves and total reserves in the various Federal Reserve districts. The evidence provided, however, cannot be considered conclusive.³³

The dominant view in the literature is that there should be greater reliance on the price mechanism and less on nonprice rationing in the allocation of Federal Reserve credit through the discount window. As will be seen in a subsequent section of this paper, proposals by Aschheim, Brunner and Meltzer, and Tobin all call explicitly for an "open" discount window—that is, one at which banks may borrow all they wish at the existing discount rate.

Announcement effects

There has recently been a growing concern with the impact of discount rate policies on expectations. Some do not necessarily agree with C. E. Walker's observation that changes in the discount rate are "a simple and easily understandable technique for informing the market of monetary authorities' views on the economic and credit situation."³⁴

According to Kareken, some asymmetrical assumptions about the behavior of lenders and borrowers are necessary in order to argue that the "announcement effects" of discount rate adjustments are necessarily stabilizing. In particular, lenders must be expected to interpret an increase in

³³ See David T. Lapkin and Ralph W. Pfouts, "The Administration of the Discount Function"; and Jimmie R. Monhollon and James Parthemos, "Administration of the Discount Function: A Comment."

³⁴ C. E. Walker, "Discount Policy in the Light of Recent Experience," p. 229.

the discount rate as a sign that tighter credit conditions lie ahead and to react with a more conservative lending policy; borrowers, on the other hand, must view the increase in the discount rate as a signal of the end of good times and cut back their spending plans and loan demands accordingly.³⁵

Samuelson is not so sure that the borrowers in fact react in such a manner. He reasons that:³⁶

Today, financial men know that the Federal Reserve "leans against the breeze," tightening money when it thinks the forces of expansion are strong and easing money when deflation seems a threat. Therefore it is rational for an investor to say, "Aha! the 'Fed' is raising interest rates; they must know that the current outlook is very bullish, and if that is going to be so, I'd better expand my operations." Conclusion: Announcement effects are often ambiguous.

Taking a position similar to Samuelson's, Warren Smith concludes that "the effects of discount rate increases on business expectations are likely to be destabilizing or, at best, neutral," but he hastens to add that he believes such effects to be "rarely of major importance" because the discount rate is only one of many kinds of information that go into the formulation of business expectations.³⁷

According to Smith, changes in the discount rate also induce shifts in expectations about monetary policy and bring on related "unsteadiness" in market rates. For ex-

ample, failure to increase the discount rate when the Treasury bill rate rises to or above the level of the discount rate may trigger a decline in interest rates, especially if current business indicators happen to be pointing downward even the slightest bit. In attempting to smooth such a swing, the System might bring about tighter monetary conditions than would otherwise be desirable. Monetary control may also be undermined, Smith argues, when a technical increase in the discount rate, to bring it in line with market rates, is interpreted as a sign of tighter monetary policy ahead and causes a sharp rise in those rates. Appropriate action by the monetary authorities in this case might result in a relaxation of restrictive policies, before such a move were deemed appropriate on general grounds.

Still another expression of concern with announcement effects is offered by Culbertson, who observes in particular that the November 1957 reduction in the discount rate "precipitated the most extraordinary bull market in bonds, a development that would have been most untimely had recession not been in the offing. The [November 1957] discount rate reduction seems to have served waiting debt speculators in the capacity of a starter's gun, and thus, to have contributed unduly to the speculative flavor of the bond market."³⁸

On the other hand, the System has observed that discretionary changes in the discount rate are a useful complement to the other major tools of credit policy because they are probably the most widely publicized step that a central bank can take—and yet they have no direct effect on the available supply of bank reserves.³⁹

³⁵ John H. Kareken, "Federal Reserve System Discount Policy: An Appraisal," p. 109.

In a more recent article, Warren Smith has expressed these conditions under which announcement effects can be assumed to be stabilizing in Hicksian terms. That is, lenders must have elastic expectations about future interest rate movements while borrowers act on inelastic expectations. See Warren L. Smith, "The Instruments of General Monetary Control," pp. 61–63.

³⁶ Samuelson, "Recent American Monetary Controversy," p. 10.

³⁷ Smith, "The Discount Rate," p. 174. A similar argument is advanced by Smith in "The Instruments," pp. 63 and 64.

³⁸ John M. Culbertson, "Timing Changes in Monetary Policy," pp. 157 and 158.

³⁹ Board of Governors of the Federal Reserve System and the U.S. Treasury, *op. cit.*, p. 146.

PROPOSED CHANGES IN THE DISCOUNT MECHANISM

The critics of the present discounting arrangement have offered alternative proposals that range from abolishing the practice to making it the most powerful tool in the central banker's kit.

Abolition of discount mechanism

Perhaps the most adamant advocate of abolishing discounting is Milton Friedman, who argues that since member banks discount at their own initiative, the Federal Reserve System cannot determine the amount of money it creates either through the discount window or through a combination of discounting and open market operations.⁴⁰ Regarding discount rate policy in particular, Friedman is highly critical of those who have looked to the level of the discount rate rather than its position relative to other rates as an indication of the tone of monetary policy. Under a discretionary discount rate policy, an unchanged rate is accompanied, according to Friedman, by unintended shifts between monetary tightness and ease as market rates change relative to the discount rate. Moreover, the occasional but usually substantial changes in the discount rate are viewed as a source of general instability. Friedman sums up his feelings as follows:⁴¹

. . . rediscounting should be eliminated. The Federal Reserve would then no longer have to announce a discount rate or to change it; it would then have direct control over the amount of high-powered money it created; it would not be a source of instability alike by its occasional changes in the discount rate and by the unintended changes in the "tightness" or "ease" of policy associated with an unchanged rate, nor would it be misled by these unintended changes; and it would be less subject to being diverted from its main task by the attention devoted to the "credit" effects of its policy.

⁴⁰ Friedman, *op. cit.*, p. 38.

⁴¹ *Ibid.*, p. 44.

However, Friedman adds one vital qualification to his argument for total abolishment. He reasons that since required reserves are calculated after the fact, some discrepancies between required and actual reserves are unavoidable. As an alternative to the current charge of the discount rate plus 2 percentage points on realized reserve deficits, Friedman offers a fixed rate of "fine" that "should be large enough to make it well above likely market rates of interest. The fine would then become the equivalent of a truly 'penalty' discount rate . . . [but] no collateral, or eligibility requirements, or the like would be involved."⁴²

It seems that Friedman was not aware of how much this one qualification weakens his solution. As Ahearn has pointed out, this qualification would replace the discount mechanism with an "overdraft system" under which everything would depend on the height of the penalty rate. If market rates of interest moved up, the penalty rate might have to be adjusted upward to keep it a penalty, which means in essence that the discount mechanism would have crept back under another name.⁴³

Professor Kareken also views the abolition of discounting as a possible alternative to the present system.⁴⁴ He reasons that in view of the growth in the public debt—and especially, of the expansion in the stock of Treasury bills—during and after World War II, there is no longer any need for discounting in order to make reserve adjustments. With the closing down of discount facilities, banks short of reserves would, according to Kareken, be forced to sell short-term Government securities. But those

⁴² *Ibid.*, p. 45.

⁴³ Daniel S. Ahearn, *Federal Reserve Policy Reappraised, 1951–1959*, p. 140.

⁴⁴ Kareken, *op. cit.*, pp. 111 and 112.

banks with reserve excesses would have a strong incentive to retain their Treasury obligations, and perhaps to acquire more.

Ahearn contends that this analysis is faulty because Kareken assumes that Government securities sold by reserve-deficient banks will be bought up by other banks, and this assumption ignores the fact that broad swings in reserve positions affect nearly all banks in roughly the same way at about the same time. If bank reserve positions were tightening, Ahearn asserts, it would actually be rational for banks with excess reserves to husband their reserves and, indeed, to sell Government securities in anticipation, before reserve positions tightened further and depressed prices of securities lower.⁴⁵ In the light of more recent developments, there is, of course, the additional argument that bank holdings of short-term Government securities may actually drop so low as to limit sales of such securities as a means of reserve adjustment.

Nondiscretionary approach

A general dissatisfaction with the discretionary features of discount policy is reflected in nearly all of the suggested modifications in this mechanism. The proposals along this line rest on the assumption that considerations of "profitability" do, in fact, bear heavily on borrowing decisions. The central feature of the proposed nondiscretionary discounting arrangements is a discount rate that is "tied" to the Treasury bill rate or some other money market rate that is relevant to borrowing decisions. Such an arrangement appears to be motivated in large part by the desire to: (1) stabilize the rate differentials that influence borrowing decisions, thus hopefully stabilizing the aggregate amount of borrowing, and (2) eliminate the threat of adverse announcement effects stemming from discretionary

changes in the discount rate. When coupled with a penalty-rate concept, this system establishes a basis for relying entirely on the price mechanism for the allocation of credit at the discount window.

The practical problem of how high to set the penalty rate is an important one. If the rate is set too high, borrowing from the Federal Reserve Banks may cease to be a practical alternative for banks unexpectedly in need of reserves. Many regard this lender-of-last-resort function as an important central bank responsibility, however, and the adverse effect on the attractiveness of membership in the System is also a consideration. On the other hand, if the penalty rate is set too low, the volume of borrowing may become "excessive." Another problem—perhaps even more thorny—is created by the fact that market interest rates do not move in perfect tandem with each other. Thus if the discount rate were tied to some particular rate, movements of other market rates relative to the chosen rate could result in continued interest-rate-induced instability in the aggregate volume of borrowing.

The choice of the market rate to which the discount rate would be tied and of the size of the differential to be used hinges in significant part on the question of whether banks balance borrowings against rates on other sources of readily available funds or whether borrowings are related to the rate that banks can earn on loans. A penalty discount rate that is effective under conditions in which borrowings are balanced against rates on marginal assets (that is, Treasury bills) may not inhibit borrowing decisions that are related to the higher returns on other types of earning assets.

Moreover, even if the discount-window authorities effectively preclude borrowing to lend at a profit under the terms of Regulation A, a given penalty rate may become

⁴⁵ Ahearn, *op. cit.*, p. 140 (n. 51).

ineffective as banks shift from one short-term source of funds to another. For example, if the discount rate is set at some specified margin above the Treasury bill rate and a substantial number of banks turn to other sources of short-term funds such as certificates of deposit (CD's), the discount rate may lose its initial penalty properties.

Warren Smith has observed that, on practical grounds, the discount rate should exceed the Treasury bill rate by a margin that is sufficient to discourage unnecessary borrowing without imposing too heavy a penalty on banks that are forced to borrow because they lack salable securities. On this basis, he determines that the discount rate should be set a full 1 percentage point or more above the Treasury bill rate.⁴⁶

Smith has been careful to distinguish between his penalty-rate system, in which the use of the discount window is penalized in cost terms relative to other sources of short-term funds, and the British plan, in which the penalty rate is related to the return on earning assets—which happens in the case of the British discount houses to be almost exclusively Treasury bills. The British penalty-rate concept is held to be impracticable in the United States “because there are several thousand member banks able to borrow directly from the Federal Reserve and invest their funds in a broad range of assets carrying widely varying interest rates.”⁴⁷

⁴⁶ Smith, “The Discount Rate,” p. 176. More recently, however, Smith has voiced reservations about using the Treasury bill rate as an anchor rate. At a Federal Reserve seminar on the discount mechanism in May 1966 he noted that in the last few years many banks have come to use CD's rather than Treasury bills in their reserve adjustments. At the same time, Smith indicated that he has become less certain of the appropriate penalty-rate spread: “There is a fuzziness about what a penalty rate is here. Does it have to be sort of higher than any rate that any bank can earn on an asset, at one extreme, or does it have just to be a little bit above the lowest rate [at which] any bank can turn out any asset, at the other extreme? It's probably somewhere in between.”

⁴⁷ *Ibid.*, p. 171 (n. 3).

In another “tied” discount rate plan, Ahearn proposes that the discount rate be anchored to the bill rate but that the Federal Reserve be allowed to vary the differential in accordance with monetary policy aims. “This would retain needed flexibility in the relation of the discount rate to other money market rates but also minimize the possibility of market misinterpretation of the meaning of discount rate changes.”⁴⁸ Brunner and Meltzer also call for an arrangement in which the discount rate would always exceed the bill rate, but not necessarily by a fixed margin. They envision a market-determined discount rate and suggest that the discount window should be kept “open” at the penalty rate.⁴⁹ Precisely how the penalty rate would be determined is not spelled out, however.

Aschheim presents a plan in which the discount rate would be tied to the rate on Federal funds instead of the Treasury bill rate because Federal funds are considered to be the closest substitute for reserve accommodation from the Federal Reserve. As did Brunner and Meltzer, Aschheim also envisions (but fails to spell out) a penalty-rate scheme in which “the ‘principles of prudent discounting’ that are currently applicable to the System’s rediscount facility could be dispensed with.”⁵⁰ He concludes:⁵¹

Where . . . open market operations are feasible, nonpenal rediscounting is—in effect—an escape mechanism for commercial banks seeking to overcome the constraint of restrictive open-market policy. Last-resort reserve accommodation via a penalty rate eliminates this escape mechanism while retaining the safety valve of central-bank lending to member banks at the latter’s initiative. Thus, in monetary systems possessing the institutional setting for open-market operations, penalty-rate rediscounting enhances the effectiveness of central bank control.

⁴⁸ Ahearn, *op. cit.*, p. 144.

⁴⁹ U.S. House, Subcommittee on Domestic Finance, *op. cit.*, pp. 89 and 90.

⁵⁰ Aschheim, *op. cit.*, p. 94.

⁵¹ *Ibid.*, p. 98.

Some technical difficulties appear to exist, however, in attempting to tie the discount rate to the Federal funds rate in instances where resort to the "window" is unlimited. The predetermined and fixed penalty spread would have to be added to some past value of the funds rate to determine the current discount rate, say, the average effective funds rate for the preceding week. The balance of supply and demand in the funds market is very shiftable, however, and the rate tends to be quite unstable. As long as the current funds rate remained below the current week's discount rate, borrowings would probably be very low. If the current funds rate should rise to the discount rate, however, banks would be indifferent between the funds market and the "window" as a source of reserves, the funds rate would rise no further, and borrowings could rise indefinitely until the demand for reserves was satisfied at the existing discount rate. Thus, it would appear that considerable instability in the volume of borrowings would be reintroduced.

In summary, those advocating a nondiscretionary discount mechanism would attempt to minimize the variability in borrowings by fixing the differential between rates pertinent to the borrowing decision and to hold down the average level of borrowings by setting the discount rate at a penalty level.⁵²

⁵² Some interesting variants of the "tied" rate plan were offered at the Federal Reserve seminar referred to in footnote 46. It was proposed, for example, that the discount rate should be linked to the Federal funds rate but that the spread should increase with both the *size* and *duration* of an individual bank's borrowing from the Federal Reserve. Another plan called for a given bank to pay a borrowing rate that is fixed in relation to its return per dollar of loans and investments, on the grounds that since the most efficient bankers constitute the hard core of borrowers, a single penalty discount rate for the system as a whole might have perverse effects by penalizing least those that tend to borrow the most. For an excellent summary of the dialogue and proposals at the seminar on discounting in May

Discretionary approach

As an alternative to his proposal for abolishing discounting, Kareken suggests that the discretionary features of discounting be strengthened.⁵³ In his view, there is no basis for thinking that nonprice rationing is in principle any less effective than price rationing in curbing unwanted expansions of Federal Reserve credit. Indeed, the discretionary approach entails the power to control total indebtedness and also to control bank lending practices selectively.

The selective control of bank lending is considered to be a means of influencing two factors of "special significance" in the contemporary inflationary process—namely, inventory speculation and money wage pressures. To the extent that funds needed to finance an inventory build-up or an increase in corporate transactions balances (in order to make larger wage payments) must be limited by member banks that make use of the discount window, the inventory and wage sources of inflationary pressures would be blunted.

Kareken notes that his plan would require the establishment of appropriate non-price eligibility conditions such as a maximum figure for the ratio of loans to total loans and investments. In addition, and in marked contrast to most of the proposed modifications in discounting, it would be necessary to keep the discount rate *below* the penalty level. "If banks are to avail themselves of the System's discount facilities and thereby to submit to the regulation of their activities it must in some sense be profitable for them to do so."⁵⁴ Aschheim indicates general disapproval of this scheme by asking the obvious:⁵⁵

1966, see: Priscilla Ormsby, "Summary of Issues Raised at the Academic Seminar on Discounting," starting on p. 47.

⁵³ Kareken, *op. cit.*, pp. 119 and 120.

⁵⁴ *Ibid.*, p. 121.

⁵⁵ Aschheim, *op. cit.*, pp. 96 and 97.

If the purpose is selective lending control, why confine it to those banks that choose to subject themselves to it? If many banks choose to shun the discount window to avoid central-bank regulation of their lending practices, how far down shall the discount rate go or how watered down shall the selective lending control be in the effort to lure more banks to the discount window?

Tobin's proposals

Professor Tobin advocates a radical departure from the current discounting arrangement that would make the discount rate "the most powerful tool in the central bankers' kit."⁵⁶ He makes two basic proposals:⁵⁷

(1) The Federal Reserve Banks should pay interest at the discount rate on member bank reserve balances in excess of requirements;

(2) Banks should be released from the prohibition of interest payments on demand deposits and from the ceilings on interest rates on time and savings deposits.

According to Tobin, the purpose of the first proposal is to tighten the control of the Federal Reserve over the opportunity cost of bank lending. By raising the discount rate, the Federal Reserve would "clearly, directly, and quickly" make lending less attractive to all banks, regardless of whether they are in debt to the Federal Reserve or not. The discount rate would become a floor to the rate on Treasury bills and similar short-term paper that banks might hold as secondary reserves.

The purpose of the second proposal is to tighten the Federal Reserve's control over the opportunity cost that bank depositors charge against any alternative investment of funds. "The rate that banks pay depositors will be closely geared to the discount rate since a bank will always be able

to earn a fraction of the discount rate (one minus the required reserve ratio) on a new deposit." Among the advantages claimed by Tobin for the second proposal are the elimination of the "unproductive efforts" devoted to economizing on cash in periods of high interest rates, and the replacement of the existing "wasteful and imperfect" non-price competition with price competition. "Better to pay depositors interest than to seek their patronage by organ music, free silverware, and plush surroundings."⁵⁸

Another important feature of Tobin's plan is that the Federal Reserve would make a perfect Federal funds market at the discount rate. Among the implications foreseen by Tobin for his proposals are that much of the short-term Government debt would be transferred to the Federal Reserve from banks and corporations, leaving them to hold excess reserves and bank deposits, respectively. Also, Tobin suspects that monetary control under his system might require much wider fluctuations in discount rates and connected short-term interest rates "than we have yet had the courage to try."⁵⁹

By way of criticism of the Tobin scheme, Ahearn points out that the potential for inflationary enlargement of the reserve base would be enormous; yet the only administrative defense against member bank borrowing would be the power to raise the discount rate.⁶⁰ The problem would be compounded by the difficulties in carrying out offsetting open market operations under conditions of dried-up public short-term Government security holdings.⁶¹

⁵⁸ *Ibid.*, p. 278.

⁵⁹ *Ibid.*, p. 279.

⁶⁰ Ahearn, *op. cit.*, p. 133.

⁶¹ This point is made by Jonathan Levin in "Professor Tobin on the Monetary Mechanism," an internal memorandum of the Federal Reserve Bank of New York, Sept. 8, 1960, p. 5.

⁵⁶ James Tobin, "Towards Improving the Efficiency of the Monetary Mechanism," p. 279.

⁵⁷ *Ibid.*, pp. 277 and 278.

BIBLIOGRAPHY

Books

- Ahearn, Daniel S. *Federal Reserve Policy Reappraised, 1951–1959*. New York: Columbia University Press, 1963.
- Aschheim, Joseph. *Techniques of Monetary Control*. Baltimore: Johns Hopkins University Press, 1961.
- Board of Governors of the Federal Reserve System and the U.S. Treasury. *The Federal Reserve and the Treasury: Answers to Questions from the Commission on Money and Credit*. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963.
- Burgess, W. Randolph. *The Reserve Banks and the Money Market*, rev. ed. New York: Harper and Bros., 1936.
- Currie, Lauchlin. *The Supply and Control of Money in the United States*, rev. ed. Cambridge: Harvard University Press, 1935.
- Friedman, Milton. *A Program for Monetary Stability*. New York: Fordham University Press, 1959.
- Goldfeld, Stephen M. *Commercial Bank Behavior and Economic Activity*. Amsterdam: North Holland Publishing Co., 1966.
- Hardy, Charles O. *Credit Policies of the Federal Reserve System*. Washington: The Brookings Institution, 1932.
- Harris, Seymour E. *Twenty Years of Federal Reserve Policy*. Cambridge: Harvard University Press, 1933.
- McKinney, George W., Jr. *The Federal Reserve Discount Window*. New Brunswick, N.J.: Rutgers University Press, 1960.
- Meigs, A. James. *Free Reserves and the Money Supply*. Chicago: University of Chicago Press, 1962.
- Riefler, Winfield W. *Money Rates and Money Markets in the United States*. New York: Harper and Bros., 1930.
- Roosa, Robert V. *Federal Reserve Operations in the Money and Government Securities Markets*. New York: Federal Reserve Bank of New York, 1956.
- Turner, Robert C. *Member-Bank Borrowing*. Columbus: Ohio State University Press, 1938.
- U.S. Congress, Joint Economic Committee. *Employment Growth and Price Levels, Hearings, "Part 4—The Influence on Prices of Changes in the Effective Supply of Money,"* 86th Cong., 1st sess. (May 25–28, 1959).
- U.S. House of Representatives, Subcommittee on Domestic Finance. *An Alternative Approach to the Monetary Mechanism* by Karl Brunner and Allan H. Meltzer, 88th Cong., 2nd sess. (Aug. 17, 1964).
- Willis, Parker B. *The Federal Funds Market*. Boston: Federal Reserve Bank of Boston, 1957.

Periodicals and Other References

- Alhadeff, David A. "Monetary Policy and the Treasury Bill Market," *American Economic Review*, vol. 42 (June 1952), pp. 326–46.
- Board of Governors of the Federal Reserve System. *Annual Report*. 1952, 1953, 1957.
- . "Excess Profits Taxes of Commercial Banks," Federal Reserve *Bulletin*, vol. 37 (June 1952), pp. 602–19.
- . "Interest Rates and Monetary Policy," by Stephen H. Axilrod and Ralph A. Young, Federal Reserve *Bulletin*, vol. 48 (Sept. 1962), pp. 1110–37.
- . "Regulation A—Effective February 15, 1955," Federal Reserve *Bulletin*, vol. 41 (Jan. 1955), pp. 9–14.
- Carr, Hobart C. "Federal Funds," in *Money Market Essays*. New York: Federal Reserve Bank of New York, 1952, pp. 13–16.
- Culbertson, John M. "Timing Changes in Monetary Policy," *Journal of Finance*, vol. 14 (May 1959), pp. 145–60.
- de Leeuw, Frank. "A Model of Financial Behavior," in *The Brookings Quarterly Econometric Model of the United States*, eds. James S. Duesenberry *et al.* Chicago: Rand, McNally and Co., 1965, pp. 465–530.
- Federal Reserve Bank of Atlanta. "The Discount Rate and Bank Lending," by Thomas R. Atkinson, *Monthly Business Review* (Feb. 1953), pp. 9 and 10.
- Federal Reserve Bank of New York. "Borrowing from the Fed," *Monthly Review*, vol. 41 (Sept. 1959), pp. 138–42.
- . "The Significance and Limitations of Free Reserves," *Monthly Review*, vol. 40 (Nov. 1958), pp. 162–67.
- . "Techniques of Member Bank Borrowing at the Federal Reserve," *Monthly Review*, vol. 46 (Apr. 1964), pp. 66–68.
- Federal Reserve Bank of Philadelphia. "Discount Rate and Discount Policy," *Business Review* (Jan. 1959), pp. 16–26.
- Federal Reserve Bank of St. Louis. "The Discount Mechanism and Monetary Policy," *Monthly Review*, vol. 42 (Sept. 1960), pp. 5–9.
- . "Some Misconceptions in Public Understanding of Monetary Policy," *Monthly Review*, vol. 41 (Nov. 1959), pp. 124–28.
- Goldfeld, Stephen M., and Kane, Edward J. "The Determinants of Member-Bank Borrowing: An Econometric Study," *Journal of Finance*, vol. 21 (Sept. 1966), pp. 499–514.
- Hodgman, Donald R. "Member-Bank Borrowing: A Comment," *Journal of Finance*, vol. 16 (Mar. 1961), pp. 90–97.

- Kareken, John H. "Federal Reserve System Discount Policy: An Appraisal," *Banca Nazionale del Lavoro Quarterly Review*, No. 48 (Mar. 1959), pp. 103–24.
- Lapkin, David T., and Pfouts, Ralph W. "The Administration of the Discount Function," *National Banking Review*, vol. 3 (Dec. 1965), pp. 179–86.
- Lindow, Wesley. "The Federal Funds Market," *Banker's Monthly*, vol. 77 (Sept. 1960).
- McKinley, David H. "The Discount Rate and Rediscount Policy," *The Federal Reserve System*, ed. Herbert V. Prochnow. New York: Harper and Bros., 1960, pp. 90–112.
- McWhinney, Madeline. "Member Bank Borrowing from the Federal Reserve Banks," in *Money Market Essays*. New York: Federal Reserve Bank of New York, 1952, pp. 8–12.
- Monhollon, Jimmie R., and Parthemous, James. "Administration of the Discount Function: A Comment," *National Banking Review*, vol. 4 (Sept. 1966), pp. 89–92.
- Polakoff, Murray E. "Federal Reserve Discount Policy and Its Critics," in *Banking and Monetary Studies*, ed. Deane Carson. Homewood, Illinois: Richard D. Irwin, Inc., 1963, pp. 190–212.
- . "Reluctance Elasticity, Least Cost, and Member Bank Borrowing: A Suggested Integration," *Journal of Finance*, vol. 15 (Mar. 1960), pp. 1–18.
- Polakoff, Murray E., and Silber, William L. "Reluctance and Member-Bank Borrowing: Additional Evidence," *Journal of Finance*, vol. 22 (Mar. 1967), pp. 88–92.
- Rolph, Earl. "Discussion," *American Economic Review, Papers and Proceedings*, vol. 45 (May 1955), pp. 411–14.
- Roosa, Robert V. "Credit Policy at the Discount Window: Comment," *Quarterly Journal of Economics*, vol. 73 (May 1959), pp. 333–38.
- . "Monetary Policy Again: Comments," *Bulletin of the Oxford University Institute of Statistics*, vol. 14 (Aug. 1952), pp. 253–61.
- Samuelson, Paul A. "Recent American Monetary Controversy," *Three Banks Review*, No. 29 (Mar. 1956), pp. 3–21.
- . "Reflections on Monetary Policy," *Review of Economics and Statistics*, vol. 42 (Aug. 1960), pp. 263–69.
- Simmons, Edward C. "A Note on the Revival of Federal Reserve Discount Policy," *Journal of Finance*, vol. 11 (Dec. 1956), pp. 413–21.

- . “Federal Reserve Discount-Rate Policy and Member-Bank Borrowing, 1944–50,” *Journal of Business of the University of Chicago*, vol. 25 (Jan. 1952), pp. 18–29.
- Smith, Warren L. “The Discount Rate as a Credit-Control Weapon,” *Journal of Political Economy*, vol. 66 (Apr. 1958), pp. 171–77.
- . “The Instruments of General Monetary Control,” *National Banking Review*, vol. 1 (Sept. 1963), pp. 47–76.
- Tobin, James. “Towards Improving the Efficiency of the Monetary Mechanism,” *Review of Economics and Statistics*, vol. 42 (Aug. 1960), pp. 276–79.
- Walker, C. E. “Discount Policy in the Light of Recent Experience,” *Journal of Finance*, vol. 12 (May 1957), pp. 223–37.
- Whittlesey, Charles R. “Credit Policy at the Discount Window,” *Quarterly Journal of Economics*, vol. 73 (May 1959), pp. 207–16.
- Young, Ralph A. “Tools and Processes of Monetary Policy,” *United States Monetary Policy*. New York: The American Assembly, Columbia University, 1958, pp. 13–48.
- Youngdahl, Richard. “Monetary Policy in Recent Years,” *American Economic Review, Papers and Proceedings*, vol. 45 (May 1955), pp. 402–08.

SUMMARY OF ISSUES RAISED AT THE ACADEMIC SEMINAR ON DISCOUNTING

Priscilla Ormsby

Board of Governors of the Federal Reserve System

Contents

Introduction	49
Role of the Discount Mechanism	50
Reallocation of Reserves	50
Regional reserve reallocation	
Sector reserve reallocation	
Use of Discount Rate to Control Volume of Borrowing	53

SUMMARY OF ISSUES RAISED AT THE ACADEMIC SEMINAR ON DISCOUNTING

INTRODUCTION

On May 11, 1966, an Academic Seminar on Changes in the Discount Mechanism was held at the offices of the Board of Governors of the Federal Reserve System in conjunction with the "fundamental reappraisal of the discount mechanism" under way within the System. This paper represents an attempt to organize and summarize what was by design a far-ranging and unstructured exchange of ideas and opinions at that seminar. The issues discussed there have been explored much more extensively in the academic literature by these same professors and by others. However, this paper presents the arguments only as they developed during the seminar and does not evaluate them—other than to comment at times on the course of the seminar discussion, or to trace their origin.

The following professors participated in the seminar:

Professor Lester V. Chandler, Princeton University, Chairman

Professor G. L. Bach, Carnegie Institute of Technology¹

Professor Edward E. Edwards, Indiana University

Professor Hyman Minsky, Washington University

Professor Franco Modigliani, Massachusetts Institute of Technology

Professor Paul A. Samuelson, Massachusetts Institute of Technology

Professor Richard T. Selden, Cornell University

Professor Warren L. Smith, University of Michigan

In addition, a large number of academicians submitted brief papers on the general topic of the role of the discount mechanism. The ideas presented in those papers appear in this summary only insofar as they were again reflected at the seminar itself.

The first section reviews, in a general way, the present and possible future roles of the discount mechanism: whether it is necessary, and if so, what purposes it should serve. The other sections contain detailed considerations of the two major issues discussed at length during the seminar: (1) the role of discounting in the reallocation of reserves; and (2) the use of the discount rate to control the volume of borrowing. A number of connected issues, which while important in themselves were treated only peripherally in the course of the seminar, are also discussed in these sections. They include the influence of existing banking structure on credit needs and the operation of the discount window, the relationship of discounting to general monetary policy, announcement effects of changes in the dis-

¹ Now of Stanford University.

count rate, and nonprice rationing at the window.

For the most part, the ideas brought forth were not restricted by the working of

the present discount mechanism and therefore they should not be evaluated in terms of laws and regulations that are in existence today.

ROLE OF THE DISCOUNT MECHANISM

The participants in the seminar were dissatisfied with the discount mechanism as it currently existed; the two chief complaints concerned “nonprice rationing” and “announcement effects.” However, unsatisfactory as the present discount mechanism might be in the estimation of the participants, there was little sentiment at the seminar for its complete elimination. The suggestion was made by several participants early in the discussion that perhaps, in the interest of tightening up aggregate monetary controls, the discount mechanism could be dispensed with. However, the suggestion was not pursued and subsequent discussion lent no support to the proposal.

One major reason seen for keeping the discount mechanism was uncertainty about the future. It was noted that the banking system is constantly changing and what seems superfluous today may become vital tomorrow; for instance, if the banking

system were to run out of the assets employed in open market operations, the window could become the major source of reserves. The possibility was also cited of the window becoming important in a changing political climate where oral suasion became the order of the day.

Although no one felt that, in today’s economy, the discount mechanism should be used as the major tool of monetary policy, a number of possible roles for the discount window were suggested by the participants. Some of these suggestions—with varying degrees of support—were to provide a safety valve for correcting mistakes in open market operations, to permit adjustments by the individual banks and regions and to protect the unit banking system. It was noted in this discussion that the discount window could simultaneously serve a variety of purposes and thus need not be limited to a single, narrow role.

REALLOCATION OF RESERVES

One of the most basic and widely accepted functions of the discount mechanism is to provide temporary assistance to individual banks and regions in adjusting to changing reserve pressures. Thus, in a sense, short-run reallocation of reserves is inherent in the window’s operation, and none of the professors questioned this sort of reallocation. The desirability of permitting longer-term reallocation of reserves through the

discount window was regarded as much more controversial, posing problems of both a political and an economic nature.

While not totally separable, the reallocation problem falls into two categories—regional reallocation and sector reallocation. Although many of the same considerations apply to both, the pattern of the discussion at the seminar seemed to warrant separate treatment in this paper.

Regional reserve reallocation

A basic consideration in evaluating the need for regional reserve reallocation is the relative freedom of capital flows among different parts of the country. The rapid growth of the California economy in recent decades was pointed to as demonstrating the adequacy of this flow. It was estimated that, during the period of most rapid growth, about 40 per cent of the money in mortgages came from out of State. It was questioned whether one could generalize from this experience, however. The example was cited of an agricultural area in which methods of farming were becoming increasingly capitalistic; however, deposits were not growing at a pace sufficient to finance this potentially profitable trend and no apparent means, such as Federal insurance of farm loans, existed for drawing in the necessary funds from other areas. It was agreed, however, that capital flows have become somewhat more flexible and responsive throughout the country since the early 1930's, due to the development of Government-sponsored protective measures, such as deposit insurance for both commercial banks and thrift institutions and mortgage insurance through the Federal Housing Authority and also the Veterans Administration.

One of the professors severely criticized the one-way flow of capital that he contended was encouraged by the present discount mechanism. According to his analysis, the New York money market banks "raided" the small country banks, drawing funds away—mainly through the use of certificates of deposit—by paying higher interest rates than the small banks could afford. He would resolve this inequity by having the Federal Reserve lend liberally to the money market banks, satisfying their

demand for funds and keeping them out of the small banks' markets. To offset the resulting reserve creation, the Federal Reserve would sell Government securities in the open market. It is conceivable that these securities could be bought directly by customers of the country banks, resulting in the same loss of funds on their part; but in contrast to the case with CD's, such purchases would not involve a personal commitment of customers to a specific money market bank.

This proposal met with very little support from the other professors. According to traditional economic logic—and assuming away any barriers to credit mobility—the fact that the New York banks could pay a higher interest rate indicated that the funds "belonged" in New York. It was also noted that the above analysis was concerned with a "bank" allocation problem, which might be quite distinct from the "customer" allocation problem. If the depositors sending their money to New York could, with equal ease, obtain loans from the New York banks, the net result for the region might be beneficial. If this were true, then the capital flow would really not be one way; it would be merely bypassing the local bank.

In the final analysis, however, a majority of the participants felt that the "small bank problem" probably existed in some degree. A second solution was offered that would create a dichotomy of banks—money market banks and nonmoney market banks. For the money market banks, the Federal Reserve would adopt something similar to the British technique of discounting—denying them access to the window and fostering the development of market operators who would use the window. The nonmoney market banks would retain access to the

window at a rate “considerably higher than the money market rate.” This suggestion likewise elicited little support from other participants.

It was noted that one of the underlying causes of whatever small bank problem existed was the currently existing banking structure. Those banks that were handicapped were typically unit banks and as such were probably inherently limited in the level of fundraising efficiency they could attain relative to the larger banks. Mixed views were apparent among the participants as to whether the Federal Reserve should work toward the liberalization of branching laws, should protect the traditional unit banking system, or should take any action in the area.

Sector reserve reallocation

The most commonly cited purpose of sector reallocation of reserves was to bypass market forces and to insulate part of the economy—the most frequently cited example is probably the homebuilding industry—from general monetary policy. This was generally envisioned as being undertaken to offset imperfections already existing in the markets and to ameliorate what would otherwise be a disproportionately large impact of policy decisions on specific sectors. The Federal Reserve might offer such selective credit assistance through the indirect method of accepting the paper of those sectors for discounting by member banks on a more liberal basis, perhaps at a preferential rate. The professors saw problems with this action, apart from the question of its desirability. It was pointed out that it was in fact a reincarnation of the commercial loan theory, long since proven ineffective. Unless the window were to accept the specified paper on a massive and perhaps unlimited

scale—a policy that could have serious consequences for monetary management, especially at a time when the over-all posture of the System was probably one of tightness—there was very little assurance that the funds thus provided would be used for the desired purpose.

Other possible actions of the System included the subsidizing of various agencies that support specific sectors, such as the Federal National Mortgage Association, or the direct purchase of the paper of specific sectors.³ The overwhelming sentiment at the seminar, however, was toward keeping any assistance as indirect as possible. None of the professors felt that the Federal Reserve had a responsibility to support any sector on a long-term basis. Perhaps if an interest rate were obviously out of line the System would be justified in stepping into the relevant market temporarily, but the border between a temporary situation and a fundamental trend is necessarily hazy, and it was noted that direct assistance to one segment of the market, even in an extreme situation, could set a precedent that would result in an increasing number of requests for such assistance.

The professors therefore favored continuing the present system of establishing separate agencies, not endowed with the power of reserve creation, to foster specific sectors. This left open the question of how deeply the Federal Reserve should involve itself in assisting these agencies; no one doubted that the System would have a responsibility to protect them from complete failure, but the professors would prefer to see the Federal Reserve remain, as much as possible, in the role of lender of last resort.

³ This course would require a change in the statute.

USE OF DISCOUNT RATE TO CONTROL VOLUME OF BORROWING

If a single recommendation could be said to have come out of the academic seminar, it would be for the Federal Reserve to make more and better use of the discount rate as a means of rationing credit. The present rate system was almost unanimously criticized, and most of the professors recommended that the discount rate be tied to some market rate. Recommendations were also made for graduated rates based on the amount of borrowing. Finally, a number of specific models using rate as the principal control device were recommended and discussed.

The major criticism of the present rate system was of the ambiguous "announcement effects" of a rate change. Without careful inspection of market rate patterns—and sometimes even with such inspection—it can be difficult or impossible to determine whether the Federal Reserve is leading the market and opening a new phase in monetary policy or lagging the market and merely adjusting to existing conditions. The value of an announcement effect was not completely rejected, however; it was pointed out that it might be extremely important in restoring international confidence in a shaky currency.

A number of recommendations were made to permit less ambiguous announcement effects. The simplest suggestion was for the Federal Reserve to issue a statement saying exactly what it wanted to convey. Such a direct method would seem to offer less chance for misinterpretation, but it would have drawbacks of its own. A statement agreed to by seven Governors or 12 members of the Federal Open Market Committee would, by the very facts of human nature, almost unavoidably be rather bland, and even the most clear-cut statement would

probably have less effect than a lasting change in rate.

A second proposal was to establish a regular schedule of changes in the discount rate. These changes would be frequent and very small and therefore should be accepted and almost unnoticed by the public, but they would allow the discount rate to keep pace with changing market rates. When the time came to announce a change in monetary policy, a relatively large change in the discount rate should accomplish this without confusion. If the sole criticism of the present rate system were the ambiguity of announcement effects, adoption of this proposal would probably be viewed as a major improvement by the academic community.

The final proposal for improving the announcement effect assumed that the discount rate would be tied to some market rate and vary with that rate automatically. Any desired announcement effect could be achieved by changing the differential between the two rates. The impact of a change in this case might be even stronger than in the previous proposal, since it would be a voted and announced change after a period of automatic and continuous adjustment.

Although the ambiguity of announcement effects was the most frequently mentioned criticism of the present rate system, most of the professors saw other benefits that would result from a tied-rate policy. One was simply an appeal to the principle of parsimony; it is wasted effort to control the money supply through open market operations and set the discount rate more or less independently when the work could be cut in half by letting the market handle the second task.

Other more positive benefits suggested for the tied rate included the insurance of a nationally determined rate automatically and a stabilization in the amount of borrowing. There was some doubt as to whether the amount of borrowing would be an invariant function of the spread between the controlling market rate and the discount rate, but it was agreed that shifts in this relationship could probably be predicted and offset.

Assuming the desirability of a tied discount rate system, a number of specific problems were identified in the establishment of that rate. These included: the choice of the market rate to which the discount rate would be tied; whether the discount rate should be a penalty rate, and if so, just what constituted a penalty; and whether there should be a freely open window at the established rate and what the implications of such an arrangement would be for general monetary policy.

The deciding factor in the choice of a controlling market rate was deemed to be the manner in which commercial banks were financing their positions—that is, the most typical source of short-term funds, apart from the discount window, to which they turned to adjust to changing reserve pressures. It was recognized that, in the current financial environment, a variety of such sources were used by the banks and there was therefore no one obvious answer to the question. However, several nominations were made for the role of controlling market rates. Historically, the most logical seemed to be the Treasury bill rate; here was an extremely well-organized market for an almost universally held instrument. However, present trends suggested that the sale of bills was becoming—and in some cases had already become—obsolete as a means of bank reserve adjustment. For

many banks, almost the whole of their declining holdings of Government securities are tied to specific purposes, such as collateralizing public deposits.

A second possibility was to tie the discount rate to the rate paid on certificates of deposit, which is of increasing importance but is still not a universally important rate for commercial banks. Another problem in this case was seen to arise from the fact that CD's are normally for maturities significantly longer than the typical adjustment borrowing at the discount window. The Federal funds rate, also suggested, was not regarded as a significant rate for all banks and also was highly volatile in the short run.

While not seriously proposed, it was suggested that the only really relevant rate for some very small country banks might be the rate they were making on their loans. A proposal made earlier, to tie the discount rate to some measure of the individual bank's profit rate, was rejected almost without discussion, apparently because this would not provide the single nationally determined price for reserve credit that they felt to be important.

There was also some discussion as to whether the rate chosen really mattered. It was pointed out that, in all but the very short run, all the rates proposed were highly correlated. Thus the choice of a base was somewhat immaterial. However, it was recognized as important that the initial value of the discount rate be appropriately set in relation to a market rate that was significant for all commercial banks. The wrong choice of the initial level was seen as having possibly disastrous results, if with that choice the Federal Reserve relinquished further control of the rate. For instance, if the discount rate were set 50 basis points above the Treasury bill rate (4½ per cent) and banks were actually

financing their positions with CD's at 5½ per cent, the discount rate would be ½ of 1 percentage point below the relevant rate. With a freely open window, the money supply would increase drastically until banks were out of CD's and financing their positions at the discount window.

The second question relating to discount rate policy was whether the rate should be at a "penalty" level relative to market rates. One of the participants, a consistent advocate of increased discount-window use, recommended that it actually be set below market levels in periods of tight money. The other professors present agreed that it should be a penalty rate, but were hesitant to commit themselves to specific figures, which they regarded as incidental to the concepts they were developing and better worked out in practice. There did seem to be general support for a penalty in the vicinity of ½ of 1 percentage point—something that would provide a deterrent to borrowing, but would "maintain the virtues of a system that permits the individual bank adjustment possibilities." It was expected that, should the Federal Reserve adopt a tied penalty rate, a period of experimentation would be required before the appropriate differential could be judged.

It was suggested that, even with a freely open window, discounting should be worth more than other methods of obtaining funds, since it provided increased liquidity to the banking system as a whole. Therefore, perhaps the entire differential of the discount rate above the market rate should not be regarded as a penalty.

Although participants in the seminar were almost unanimously in favor of a tied rate, there was some doubt expressed as to how much such an arrangement would actually accomplish. It was pointed out that the Federal Reserve had a major effect,

through its open market operations, in determining the level of market rates, so perhaps it was wrong to speak of an independently determined discount rate. In the final analysis, the System played a major role in both money supply policy and interest rate policy, regardless of how it chose to exercise these roles.

The question of an open window with a tied rate was recognized as important for general monetary policy. The problem in the case of a poorly chosen discount rate was discussed above. But even if the discount rate were set above the appropriate market rate, possible problems were foreseen. The increased cost of credit at the window had to be looked at in conjunction with the increased availability. Basically, no matter how high the rate was set, the central bank gave up direct control of the volume of reserves created and supplied through the discount window.

Advocates of an open window pointed out that any undesired reserve creation through the discount window could be offset by open market operations. This was fairly generally accepted as true in principle—at least in the absence of a shortage of assets employed in such operations, seen by some as a possibility—but it was felt that it could require continuous offsetting operations and, in the extreme case, on a massive and unheard-of scale. Some noted that in the proper environment an open window could have the advantage of avoiding great scrambles for funds that sometimes result in disorderly rate patterns.

None of the professors advocated a permanently open discount window at a rate that the Federal Reserve could not control. The System should always have the option of increasing the rate spread if borrowing became obviously excessive. Two more continuous methods of controlling the vol-

ume of borrowing within a tied-rate system were suggested: (1) a graduated penalty rate based in some way on the amount of borrowing; and (2) the kind of administrative, nonprice rationing employed today.

The first possibility, while not actively supported by all those at the seminar, was unanimously viewed as feasible. Advocates of a graduated rate schedule variously supported two versions; the more popular would base the schedule on the amount of borrowing by the individual bank. This was seen as consistent with the fact that the System was trying to influence individual decisions and as more effective from an allocative point of view. The alternative version would base the penalty schedule on the aggregate amount of borrowing by member banks. It was felt by some that such an arrangement would avoid penalizing an individual bank that was the innocent victim of an adverse situation rather than a guilty party, or a bank with unusually profitable opportunities which was therefore justified in unusually large borrowing.

Nonprice rationing was rejected by the seminar participants more by omission than commission. The general feeling seemed to be that it was too personal and apt to be arbitrary. The only statement offered in its defense was that it might prove useful if, because of circumstances beyond the System's control, the U.S. economy found itself in an extreme inflationary spiral. Under anything approaching normal circumstances, however, the professors were unanimously opposed to its use.

The remainder of this section describes a number of specific models using rate to control the volume of member bank borrowing that were proposed by seminar participants. None of these represents a closed and self-sufficient system, but they never-

theless represent a more structured level of thinking than the earlier discussion.

In the first model proposed, the discount rate would be tied to an average for the past 2 weeks of the Federal funds rate. This rate was chosen because the Federal funds market is, like discounting, a short-term source of funds and is, therefore, for the member bank—although not for the System—the closest alternative to borrowing at the window. The discount rate would be set 100 basis points above this past average of the Federal funds rate. With a freely open discount window, this would limit swings in the Federal funds rate by creating a ceiling on that rate. In the short run, this could create a spiral situation, since there would be a tendency for the Federal funds rate to increase until it was equal to the discount rate. Thus, in the extreme, the discount rate would equal a past value of itself plus the differential. However, in practice this tendency could be controlled by open market operations conducted in such a way as to reduce the banks' necessity to stay in debt, and it would have a natural limit since, if the rate became too high, banks would presumably find it desirable to adjust their basic positions by such methods as calling loans and selling off other assets.

The second model had as its immediate goal the stabilization of the amount of free reserves that, it was argued, would "give a fairly rigid relation between what the central bank directly controls and the total amount of reserves." The amount of borrowing would be controlled by tying the discount rate to a market rate—the rate was not specified in this case. The discount rate would be above this and would increase with extensive use of the window; the term "extensive" probably encom-

passes both duration and amount of borrowing. The amount of excess reserves would be controlled by paying interest on them. This rate would also vary with a market rate—and here the Federal funds rate was specified—but would be below that market rate. Advocates of this model would even go so far as to impose a penalty on the holding of excess reserves if the Federal funds rate fell that low.

A somewhat more conventional model proposed would employ a nationwide discount rate tied to and slightly above some market rate. Proponents of this model chose the Treasury bill rate for this purpose but felt that the choice was somewhat arbitrary. They would decrease over time the amount of nonprice rationing and eventually eliminate it altogether. The rate could be adjusted as the system was perfected, but massive change would be employed only when

the Federal Reserve wanted to create an “announcement effect.”

The final model would provide for automatic determination of the discount rate, not by tying it to any one market rate but rather by having the System regularly auction a specified amount of borrowed reserves in a manner somewhat analogous to the weekly Treasury bill auction. The System could then directly control the money supply and would have the added advantage that the discount rate would be auction determined and would not be tied to any market rate that could become obsolete. This arrangement could result in tremendous rate instability, however, in cases where unusual circumstances caused a great scramble for funds. To offset this, a penalty rate could be instituted, above the auction rate, at which reserves were available for the rest of the period, or very frequent—even daily—auctions could be held.

SOME PROPOSALS FOR A REFORM OF THE DISCOUNT WINDOW

Franco Modigliani

Massachusetts Institute of Technology

Contents

Goals to be Achieved	61
Proposed Devices to Improve Federal Reserve Control Over the Money Supply While Permitting Unrestricted Use of the Window	61
Sources of slippage between nonborrowed reserves and the supply of demand deposits, and how to reduce them	
Outline of proposed reform—basic features	
Elaboration of the proposal	
Behavior of free reserves and supply of demand deposits under the proposed system	
Choice of penalty rate—case for a sliding differential	
Possible minor improvement: payment of interest on excess reserves	
Proposal for Special Borrowing Facilities Aimed at Improving the Spatial Allocation of Bank Credit	72
Proposal outlined	
How the term window could contribute to allocative efficiency	
Operational aspects	
How large a target volume of borrowing?	
Some minor complementary suggestions	

SOME PROPOSALS FOR A REFORM OF THE DISCOUNT WINDOW

GOALS TO BE ACHIEVED

The purpose of this paper is to outline several proposals for a reform of the Federal Reserve discount window. These proposals are aimed at achieving the following major goals:

1. To eliminate the discretionary and sometimes capricious elements that characterize the present administration of the window by permitting unrestricted use of such borrowing facilities by all creditworthy borrowers that are willing to pay the discount rate.

2. To reduce the slippage that exists between nonborrowed (bank) reserves and the supply of demand deposits by reducing swings in free reserves, especially those of a procyclical character, and thus improve control of the Federal Reserve over the money supply and interest rates.

3. To make available to smaller banks facilities analogous to those provided by the markets for Federal funds and certificates of deposit, from which these banks are now partially or totally excluded because of the small size of their operations.

4. To contribute through goal 3 and other devices to an improved spatial allocation of bank credit.

It is believed that the proposed reform would also make possible the achievement of two other goals:

5. To eliminate the announcement effects that result from sporadic and hence sizable changes in the discount rate, and

6. To provide a stronger inducement than now exists for banks to become members of the Federal Reserve System, which would contribute to goal 2.

PROPOSED DEVICES TO IMPROVE FEDERAL RESERVE CONTROL OVER THE MONEY SUPPLY WHILE PERMITTING UNRESTRICTED USE OF THE WINDOW

This section discusses six devices that it is believed would improve Federal Reserve control over the money supply while permitting unrestricted use of the discount window.

Sources of slippage between nonborrowed reserves and the supply of demand deposits, and how to reduce them

As is well known, the slippage that exists between the volume of nonborrowed re-

serves, which the Federal Reserve controls largely through open market operations, and the supply of demand deposits can be traced primarily to variations in free reserves. Our primary concern in this section is with methods of reducing such variations while at the same time keeping the discount window open to all creditworthy borrowers willing to pay the price.

Other major sources of slippage—such

as variations in the reserve ratio as a result of shifts of deposits between banks with different reserve requirements and between member and nonmember banks, changes in time deposits, and currency drain—would not be affected by the proposed reforms except indirectly through goal 6 to be achieved (see description on the preceding page).

The operation of the discount window obviously affects free reserves through borrowing. It is reasonable to suppose that the volume of bank borrowing is influenced in part by the profitability of borrowing, as measured by the spread between the discount rate and short-term market yields; this supposition is supported by the empirical evidence. It is also generally agreed that a rise in aggregate demand and economic activity tends initially to be accompanied by a rise in short-term market yields unless it is accommodated by a commensurate expansion of the money supply.¹ Under these conditions, as long as the discount rate is kept unchanged, a rise in demand tends to increase the profitability of borrowing; and since the rise in market rates also tends to reduce the demand for excess reserves, the result is likely to be a reduction of free reserves and thus a procyclical movement in the money supply, relative to nonborrowed reserves.

Under the present system this tendency is, of course, moderated by various limitations on the use of the discount window through regulations, frowns, and suasion. Such administrative limitations in turn seem unavoidable so long as the discount rate is changed only infrequently, permitting sizable fluctuations in the spread between it and short-term market yields and corresponding variations in the incentive to borrow. Furthermore, since changes in the discount rate have tended to occur infre-

quently, and often only after some debate within the Federal Reserve System, they have come to acquire a symbolic meaning (even if often a rather obscure one) apt to generate wide repercussions. And this very feature in turn has contributed to the practice of avoiding frequent changes in the rate.

Clearly the source of slippage between nonborrowed reserves and the money supply described above would be reduced if the discount window could be redesigned so as to minimize fluctuations in the incentive to borrow. The simplest way to achieve this result, of course, would be to shut the window altogether. But this solution is clearly inconsistent with preserving the essential role of the central bank as a lender of last resort. Individual banks must have an outlet to which they can turn in case of “justified need” and, similarly, some methods must be provided by which the banking system as a whole can manage to satisfy reserve requirements in a way that is not unreasonably painful.

However, there is no reason in principle why borrowing from the discount window should not involve some significant penalty. Accordingly, one possible device to limit substantially the use of the window would be to set the discount rate at some level substantially above short-term market rates. There would then be an incentive for banks to avoid the risk of having to borrow and to repay promptly any borrowing that might have been incurred due to miscalculations of or unanticipated contractions in nonborrowed reserves. Yet banks could be allowed unrestricted use of the window subject only to normal and prudent standards of creditworthiness, for use of the window would be limited by the cost of borrowing, without any need for fiat or frowns.

However, this approach has two major drawbacks: (1) Since the “penalty” would

¹ See the discussion on pp. 64–69.

depend on the relation between the discount rate and market rates, it would still be necessary, in order to keep the penalty reasonably uniform over time, to change the discount rate from time to time. And that would perpetuate the announcement effects. (2) The method would in effect discriminate against small banks, which cannot make effective use of the Federal funds market as a source of funds. Indeed, if the banking system as a whole were out of debt, which presumably would be the normal circumstance under a penalty-borrowing rate, the Federal funds rate would tend to hover below the discount rate and around short-term market yields, say the rate on 3-month Treasury bills (hereinafter referred to as 3-month bills, or in some instances, bills). Thus, individual banks having access to that market could make up their deficiencies at that cost. Yet the smaller banks would have to pay the significantly higher penalty rate.

It is suggested that these shortcomings could be eliminated, while retaining the basic idea of a wide-open window at a penalty rate, by reorganizing the operation of the window along the lines set forth in the remainder of this section.

Outline of proposed reform—basic features

1. The window would be open to all borrowers willing to pay the discount rate as long as they met some appropriate tests of creditworthiness. To avoid uncertainties, each bank would be informed about the maximum amount of accommodation that it could expect to receive. The ceiling would be reviewed at stated intervals, except under special circumstances requiring a reappraisal of the bank's credit standing.

2. The borrowing rate would be tied to a short-term market rate, say for the moment, the 3-month bill rate. This device would eliminate sizable, discontinuous

changes in the discount rate and associated announcement effects.

3. To maintain the penalty character of the window, the borrowing rate would be fixed at, say, last week's bill rate plus a fixed number of basis points, or plus a fixed percentage. Considerations relevant in setting the size of the penalty are set forth later.

4. Borrowing at the window would be for very short terms—usually for a single day—although automatically renewable at the option of the borrower.

5. To avoid discrimination against smaller banks, the Federal Reserve would provide, for such banks, accommodations similar to those obtainable through the Federal funds (hereinafter abbreviated FF) market. Specifically, those entitled to the special accommodation would be allowed to borrow at the window at a daily rate equal to that day's average FF rate plus a commission, consisting of a fixed but moderate number of basis points or a moderate percentage charge, as noted above. This facility could be provided for banks not exceeding a certain size, or for those at particular locations, or perhaps more equitably, for loans not exceeding a stated modest size. If the last device were adopted, one might expect that this facility would, in fact, be used only by the smaller banks with inadequate access to the FF market.

Elaboration of the proposal

It should be noted that the reform outlined above is only part of a broader plan. Indeed, what has been proposed so far would be of no help in achieving goal 4—improved spatial allocation of bank credit. To that end there is a separate proposal, described in the last section, to provide facilities for longer-term borrowing. Accordingly, the rest of this section is concerned only with the operation of the "1-day window."

The first questions that need to be considered are: To what rate should the discount rate be tied? How large should the premium be? These two questions are closely interrelated. Clearly, it would be desirable to anchor the discount rate to the yield of some market instrument of major importance—one that has a broad, well-organized market. This would insure that the chosen rate would be “representative” and relatively free of erratic movements. From this point of view, the 3-month bill rate would seem to be an obvious choice, at least under present arrangements.

There are, however, two related problems to be considered. First, any specific instrument may, at times, reflect special influences. Second, there are some delicate issues involved in tying a 1-day rate to a 3-month rate, if at the same time borrowing is unrestricted. In particular, “term structure effects” (for example, expectations of a fall in the 3-month rate) might make it profitable to borrow short at a rate negligibly higher than the 3-month rate.

To avoid these problems, it would seem desirable to peg the discount rate substantially above the 3-month bill rate. One relevant guide in deciding on the size of the premium is provided by the consideration that, with a truly open discount window, the discount rate, by and large, would set the ceiling for the FF rate. In other words, as the FF rate approached the discount rate, the demand for funds would become highly elastic as would-be borrowers turned to the window. This consideration suggests that the premium should be sufficiently large to allow the FF rate to deviate from the bill rate as much as might be justified by term structure and other special circumstances affecting the bill rate, without making it “profitable” to borrow at the window.

While it is impossible to set an absolute limit, the above considerations suggest a

premium on the order of 100 basis points, a margin somewhat larger than the largest amount by which the weekly average FF rate has exceeded the 3-month bill rate in recent years. (Unfortunately, this experience is a very limited one since, as is well known, until early 1965 habits and convention prevented the FF rate from being bid above the discount rate; this, of course, also tended to distort the relation of the FF rate to other rates.)

With such a differential, one could accommodate substantial variability in the proper relation between the FF rate and the short-term rate to which the discount rate was tied, without creating incentives to borrow at the window and hence without causing undesirable flurries in the volume of borrowing. An alternative, and probably more effective, device to guard against this source of difficulty is discussed below. It would be to rely on a floating differential.

But first, it is well to examine more closely both the long-run and short-run behavior of the proposed system—assuming the premium over the bill rate to be substantial but of fixed size. We propose to show that, under this system, free reserves would tend to fluctuate rather narrowly around a substantially constant “equilibrium” level. In other words, while fluctuations of free reserves would not be—and should not be—altogether eliminated, deviations of free reserves from the constant equilibrium level would set up strong forces tending to move these reserves back toward equilibrium.

Behavior of free reserves and supply of demand deposits under the proposed system

The analysis that follows is based largely on some very definite views as to the major forces that shape banks’ portfolio management and their use of the discount window, as well as the behavior of short-term mar-

ket yields. These views in turn appear to receive strong support from the empirical analysis of recent experience undertaken in the course of the MIT–Federal Reserve econometric research on the working of stabilization tools.²

This evidence supports the view that the volume of free reserves outstanding at any given time reflects two basic sets of forces:

1. An “equilibrium” component, to wit, the desired or equilibrium level of free reserves. This equilibrium level itself is the difference between (a) desired excess reserves, which depend on short-term market yields and tend to decrease as these yields increase, and (b) the optimum volume of borrowing at the window, which is basically controlled by the spread between short-term market yields—such as the FF rate or the 3-month bill rate—and the discount rate. (Note, however, that the FF rate is an adequate measure of short-term yields only for the very recent period when that rate was not conventionally kept at, or below, the discount rate.)

2. A disequilibrium component reflecting the inability and/or undesirability of banks to adjust instantaneously to unforeseen (or transient) changes in their deposits or in the demand for commercial loans. The unforeseen changes in demand deposits in turn reflect (a) unforeseen changes in nonborrowed bank reserves due to Federal Reserve operations and changes in currency holdings (and time deposits), and (b) the unforeseen effect on demand deposits of expansion and contraction in bank credit itself. Component (b) implies that, even in the absence of the changes under (a), the adjustment of free reserves

² See especially Modigliani, Rasche, and Cooper, “Central Bank Policy, the Money Supply, and the Short-Term Rate of Interest.” *Journal of Money, Credit, and Banking* (May 1970). Other results are contained in yet unpublished memoranda of the project; it is expected that these results will be published in the near future.

to their equilibrium level tends to occur gradually over time—somewhat along the lines of the textbook description of the process of expansion of deposits in response to an initial disequilibrium. In addition, the process of adjustment gets disturbed by the changes under (a). Thus free reserves tend to be high when there is an unforeseen increase in nonborrowed reserves or an unforeseen slackening in the demand for commercial loans, and to be low when the unforeseen changes are in the opposite direction.

The evidence referred to above also supports the view that changes in short-term market yields (say, the 3-month bill rate or the commercial paper rate) are accounted for largely by the interaction of the supply of demand deposits, controlled by the forces outlined above, and the demand for demand deposits, which is basically controlled by current and past levels of income and short-term market yields. It further suggests that in the short run (say, a quarter or less) the level of income is largely unaffected by variations in the money supply or short-term interest rates (at least as long as these remain within realistic limits). It therefore follows that, in the short run, the level of short-term market yields is controlled, in the last analysis, by the behavior of the outstanding stock of demand deposits.

In light of the above interpretation of bank behavior, we can examine first what would happen to the “equilibrium” level of free reserves under the proposed system. To this end, it is convenient initially to ignore operations at the special discount window provided for small borrowings.

It should be evident that by floating the discount rate sufficiently above short-term market yields the desired or equilibrium level of borrowing can be brought essentially to zero, and this would be true regardless of the level of the short-term rate. (By

contrast, under the present system a rise in market yields increases the equilibrium level of borrowings unless, and until, counteracted by a rise in the discount rate.) It then follows that the equilibrium level of free reserves would itself tend to be constant except for the effect of market yields on excess reserves. However, this effect appears to be fairly moderate, except possibly for extremely low levels of market yields where "liquidity-trap phenomena" could become significant.³ Furthermore, even this effect could be eliminated by the device of paying interest on excess reserves, as is discussed in the last part of this section. But even without this device we are led to the conclusion that the equilibrium level of free reserves would tend to be stable (and prevalently positive) under normal conditions, except for some tendency to decline mildly with the prevailing level of market yields.

Finally, we may note that if the system were in a position of equilibrium, with borrowings near zero and excess reserves in equilibrium, then one could expect the FF rate to hover around the bill rate. More precisely, in the absence of term-structure effects (that is, if short-term rates were anticipated to stay unchanged in the near future), it should tend to be quite close to the bill rate, although term-structure effects could cause it to deviate, within limits, on either side of the bill rate. This proposition seems fairly obvious and can be supported by a more rigorous analysis, which we need not spell out here.⁴ The above considera-

³ Analysis of recent years suggests that an increase of 100 basis points in short-term yields—in, say, the 3-month bill rate—tends to reduce excess reserves by somewhat less than \$50 million within 1 month and by somewhat less than \$100 million within one to two quarters.

⁴ The above conclusion rests on the assumption that bills will continue to represent an important component of secondary reserves and sources of short-term liquidity. Should this premise lose its validity and bills cease to be held by banks in significant

tions have the following implication, which is important for an understanding of the workings of the proposed reform: provided the discount rate were set significantly above the 3-month bill rate, and if the system were in a position of equilibrium, the FF rate could be expected to be significantly below the discount rate.

We can now reintroduce the special "Federal funds window" for small operators and show that this does not significantly change the above conclusion. We need observe only that those who are eligible to use the special window and who find it economical to do so would be borrowing at a rate differing only by a small commission from the rate available to any would-be borrower; namely, the FF rate. Since the relation between the FF rate and short-term yields was just shown to be such as to induce the banking system as a whole to hold positive-free reserves, regardless of the level of short-term yields, we can infer that this relationship would provide the same incentive to special borrowers as a whole. Hence, these borrowers would also tend to hold a positive and relatively stable amount of free reserves; these reserves would probably exhibit some tendency to move inversely, but moderately, with the level of market yields. Note, however, that the amount of borrowing at the special, in contrast to the regular, discount window would not be zero since some operators would on the average be borrowing there, just as many other banks would, on the average, be borrowing from the FF market. All we are asserting is that the net free reserve position of the group as a whole would tend to be stable.⁵

quantity—except for the purpose of satisfying collateral requirements—then the bill rate would no longer provide a reliable yardstick of short-term yields and hence would no longer be a suitable rate on which to anchor the discount rate.

⁵ This note appears on opposite page.

We can now examine the short-run, dynamic behavior of the model in response to developments pushing it out of equilibrium. For analytical purposes we can distinguish between disturbances originating in the economy and those originating from Federal Reserve actions, although of course in general both types of disturbances may occur simultaneously and reinforce or offset each other.

1. Consider first the response of the banking system to a situation in which the Federal Reserve wished to hold down the money supply and raise short-term market rates. To this end the Federal Reserve would force an (unanticipated) contraction in nonborrowed reserves (relative to the normal seasonal and secular pattern). As a result, free reserves would initially fall short of the planned level. This implies an increase in the demand for, and/or a decrease in the supply of, funds in the FF market, which would immediately raise the FF rate. If the Federal Reserve action were sufficiently strong, the shortage of reserves would be such as to push the FF rate to the ceiling provided by the discount rate. At this point some banks would be induced to borrow at the window, thus acquiring the additional reserves needed to satisfy reserve requirements (plus the demand for excess reserves, probably somewhat reduced). But now the higher cost of borrowing

(whether at the window or in the FF market) relative to other short-term market yields would put pressure on banks to reduce their asset portfolios, thereby shrinking the supply of demand deposits and required reserves, until the borrowing had been eliminated and free reserves had moved back to equilibrium. In the process short-term market yields would, of course, tend to move up, which is presumably what the Federal Reserve intended. But note that this rise would not per se reduce the pressure for the banking system to get out of debt. Indeed, with the discount rate floating above the bill rate, a rise in the latter would not reduce the incentive for individual banks to avoid a net borrowed position.

2. Suppose instead that the Federal Reserve wished to expand the money supply and lower short-term market rates, and accordingly brought about an unanticipated expansion of nonborrowed reserves. Here initially free reserves would exceed the planned amount, causing an increase in supply and a fall in demand in the FF market. This would lower the FF rate relative to the bill rate, encouraging an expansion of banks' portfolios and the money supply and leading to an increase in required reserves. The incentive to expansion would persist until free reserves had moved back to equilibrium, and thus the FF rate had re-established its equilibrium relation to the bill rate. Here again the bill rate would presumably fall in response to bank expansion, as intended. But this fall would not reduce the incentive to expand the money supply until the additional reserves had been absorbed by higher required reserves; for as long as free reserves remained above equilibrium, the FF rate would tend to remain below the rate on bills and other short-term instruments.

3. By relying on the reasoning developed earlier, one can also readily establish

⁵ At a more refined level of analysis, one should recognize that the incentive structure would be a little different for those operating at the special window. In the first place, if banks were short of reserves, they would be paying somewhat more than the larger operator using the FF market. In addition, they would probably earn less if they were long on reserves. In fact, small operators would probably tend to hold any excess funds in the form of excess reserves yielding nothing, instead of lending them in the FF market where they would yield the FF rate less transactions costs. (However, these qualifications do not require modifying our conclusions that their "equilibrium" level of net free reserves would tend to be stable though probably somewhat higher than for the larger operators, and probably also somewhat less responsive to variations in market yields.)

that the pressures and responses described in (1) and (2) apply equally to the subset of "small" operators having access to the special "Federal funds window."

In summary, an (unanticipated) expansion or contraction of nonborrowed reserves would, initially, be reflected largely in opposite movements of free reserves and of the FF rate, relative to the bill rate. But this would be only a temporary and (appropriate) cushioning reaction. For the movement of the FF rate in turn would generate incentives to actions that would tend to bring free reserves back to the initial equilibrium (except for the small effect of the change in short-term market yields on excess reserves). With free reserves moving back to the original position, the supply of demand deposits would tend to move commensurately with the change in nonborrowed reserves. The final change in short-term market yields (that is, the bill rate) would then depend on the size of the change in nonborrowed reserves and the (short-run) elasticity of demand deposits with respect to short-term yields.

4. Consider next the effect of an increase in the demand for money—an upward shift in the demand schedule relating money demand to short-term yields. This would tend to raise short-term market yields, unless the money supply increased. But there could be no significant increase in the money supply so long as the Federal Reserve kept the level of nonborrowed reserves unchanged. Indeed, under these conditions, the money supply could expand significantly only through an increase in borrowing. But since the rise in the bill rate would be accompanied by a commensurate rise in the discount rate, there could be no incentive for banks to expand their borrowings. With borrowing unchanged, free reserves would also be unchanged, except again for a moderate decrease in response

to the higher market yields, and hence the money supply would be basically unchanged, as stated above. Needless to say, if the Federal Reserve wished to prevent the bill rate from rising, it could do so by supplying additional reserves, in amounts sufficient to increase the supply of demand deposits *pari passu* with the increased demand. The reasoning can be repeated *mutatis mutandis*, in the presence of a decrease in the demand for money and falling interest rates.

5. A different and very important type of disturbance originating from the economy would be an (unanticipated) surge of demand for commercial loans. Banks, as suggested earlier, would initially tend to accommodate the increase without a commensurate reduction in the rest of their portfolio. Hence, the supply of demand deposits and required reserves would in the first instance rise. But with nonborrowed reserves unchanged, the system would be short of reserves, and hence the FF rate would tend to be pushed to the discount rate ceiling, opening up the window to an amount of borrowing needed to satisfy reserve requirements. But again the increase in the cost of borrowing (whether at the window or in the FF market) relative to short-term market yields would generate an inducement for banks to reduce their portfolios and the supply of demand deposits until the borrowing had been eliminated and free reserves had moved back to equilibrium. Of course, the reshuffling of bank portfolios would likely involve some net liquidation of bills and other market instruments to accommodate the expansion of loans, which would result in some increase in short-term market yields. But once more this would not modify the incentive for the banking system to get out of debt to the Federal Reserve since the discount rate would be moving *pari passu* with the bill rate.

Similar conclusions hold *mutatis mutan-*

dis, if an unanticipated decline occurred in the demand for loans.

The above analysis has one implication that is worth noting. It should be apparent that under the proposed reform a level of free reserves in excess of the constant equilibrium level would tend to be accompanied by an expansion of the money supply. Furthermore, the larger the excess, the larger the rate of expansion of the money supply would tend to be. Conversely, free reserves below that constant level would tend to be accompanied by a contraction of the money supply at a rate commensurate with the negative gap. The proposed reform would thus tend to validate a view of long standing that there is a direct, reliable association between the volume of free reserves and the rate of change of bank credit and the money supply. Yet, paradoxically, this view is *not* warranted under the existing set-up in which the equilibrium level of free reserves is not stable over time because of variations in the spread between the discount rate and market yields. It is not inconceivable that reliance on that unwarranted view may have been responsible for certain past failures in monetary management.

Choice of penalty rate—case for a sliding differential

We are now in a position to set forth the main considerations that would seem relevant in setting the size of the differential between the discount rate and the bill rate, or other short-term rate, to which it was tied.

It follows from the analysis of the preceding section that the essential implication of a large differential is that banks would tend to find it undesirable to stay substantially in debt for extended periods. But this means, in turn, that the volume of demand deposits could be kept under close control by the Federal Reserve through its

control over nonborrowed reserves (and reserve requirements). At the same time, since a temporary shortage of reserves could push the FF rate as high as the discount rate, a large differential would imply the possibility of substantial short-run variability of the FF rate and related very short-term market rates. By the same token, a small differential would imply more limited variability of the FF rate but at the cost of tolerating a larger and longer-lasting departure of the money supply from the level determined by nonborrowed reserves—that is, in essence, a looser coupling between nonborrowed reserves and the money supply.

The above considerations suggest that the choice of the differential would be dependent in large part on one's view concerning the nature of the monetary mechanism. Those holding that the cutting edge of monetary policy rests on the effects of such policy on interest rates and related financial yields would presumably be led to favor a set-up that minimized unintended movements of interest rates and hence to prefer a relatively small differential. On the other hand, those leaning toward the view that the money supply affects economic activity directly might well be led to favor a system that minimized unintended movements in the money supply, even at the cost of larger short-run fluctuations in interest rates.

In my view, however, a reasonable choice of differential does not really require settling the thorny issue about the nature of monetary linkages. For whatever one's view on that issue, presumably it is generally agreed that departures from the intended course, whether of the money supply or of very short-term market rates, can have a noticeable effect on the economy if they persist—but not if they are ephemeral. And this is particularly true once the rules of the

game are well understood and stable and the participants have had a chance to adjust to them.

Hence, insofar as purely transient disturbances are concerned, the choice of the differential is unlikely to be of real consequence. On the other hand, in the case of marked and/or persistent departures, the Federal Reserve would soon have to reach a decision as to whether the most suitable response involved modifying the interest rate target or the money supply target, or some combination thereof. In such circumstances, the choice of the differential would therefore control only the character of the short-run, semiautomatic response of the model, while the Federal Reserve made up its mind as to the appropriate eventual response.

In any event, the dilemma of choosing between a high or a low differential could be avoided by adopting a "compromise" system, which should prove largely agreeable to both points of view. The compromise would consist of *tying the discount rate to the bill rate with a variable peg*. Under this scheme the differential would remain fixed at some base level as long as aggregate borrowing at the discount window remained below some stated amount. But if borrowing were to exceed this amount, then the differential would rise with the volume of aggregate borrowing, according to a pre-established schedule.

By making the base level of the differential relatively modest, moderate and transient variations in the demand for money could be absorbed by an elastic money supply, with minor effects on market yields. This feature appears especially desirable in light of the difficulty in determining reliably the demand-for-money schedule, and hence the supply of deposits appropriate to a certain level of short-term rates. Yet, larger and more persistent disturbances, while still

initially accommodated at the window, would be accompanied by a larger increase in the differential cost of borrowing, which would put pressure on banks to eliminate rapidly at least a portion of their borrowing. Such disturbances would thus tend to be communicated promptly to interest rates, unless of course the central bank decided to accommodate the larger demand by increasing the supply of reserves, thus reducing the effect on interest rates.

Finally, it should be noted that while the schedule of penalty rates would influence the response to a tight money situation, such a schedule would have little influence in shaping the response to a loose situation, characterized by a rise in free reserves. That response would be controlled by the fall in the FF rate below market yields and by the speed with which banks would respond to this situation by expanding their portfolios of earning assets.

Possible minor improvement: payment of interest on excess reserves

I have noted, in setting forth the anticipated behavior of the banking system under the proposed reform, that some variation in free reserves would continue to be present because of the negative association between equilibrium excess reserves and short-term market yields. Even this source of variation in equilibrium free reserves could be largely, if not totally, eliminated by the simple device of paying interest on excess reserves at a rate tied to short-term market yields.

It is suggested that the most effective arrangement would be to peg the interest on excess reserves a certain number of basis points (or a fixed percentage) below the FF rate. (The differential could be thought of as something in the nature of a commission paid to the Federal Reserve Bank for investing the free reserves of the banks owning them.)

This arrangement could be expected to have the following major effects: (1) If the differential were made sufficiently large—say on the order of 50 basis points, or even somewhat larger—there would still be an incentive, at least for larger banks, to invest unneeded reserves directly in the FF market to avoid the differential. Thus, one would largely preserve a well-working FF market. (2) Smaller banks not having ready access to the FF market would be able to derive an income from their reserve surpluses commensurate with that earned by the larger banks, except for a reasonable commission. (3) Because those now relying on the FF market as an outlet for their surplus funds would gain less from this activity than under the old system—to be precise, they would earn the differential instead of the full FF rate—one would expect that the equilibrium demand for excess reserves would increase. (4) But under the new system the amount gained by investing surplus funds in the FF market instead of keeping them as excess reserves would become a constant—the differential—that would be independent of the level of the FF rate. Thus, while the equilibrium level of excess reserves would presumably tend to be generally larger than under the present system, it would become independent of fluctuations in short-term market yields.

Even greater stability in the level of excess reserves could be achieved by use of a sliding differential similar to that proposed above for the discount rate. That is, the differential would be kept constant as long as excess reserves were below some stated amount; but if excess reserves grew larger, the differential could be increased—thereby encouraging investment in the FF market, which would lead to a lower FF rate, and thus finally, through portfolio expansion, to a reduction in excess reserves.

One important caveat must be entered

at this point. The stabilization of excess reserves results from making the opportunity cost of holding excess reserves independent of the level of market rates. However, a difficulty would arise if the FF rate became so depressed as to be lower than the posted differential. Under such circumstances, because the interest paid on excess reserves cannot be less than zero, the differential itself would have to be reduced—which would lead to an increase in the desired level of excess reserves. What this means, of course, is that the payment of interest on excess reserves is an effective stabilizer of excess reserves only so long as the banking system does not encounter liquidity traps; but it affords no protection against a liquidity trap.⁶

⁶ It would be possible, in principle, to design the proposal so that it could afford some protection even against situations of very low returns from investments and associated very low market yields. But this would require the radical step of applying the differential even when the FF rate were so low as to imply a *negative* interest—or in other words, the levying of a penalty—on excess reserves. The general effect of such a penalty, of course, would tend to be that of making it possible for market yields to become extremely low—indeed in principle even negative. This, in turn, would clearly be a useful stabilizing mechanism. I must hasten to add, however, that it is hard to say just how effective this mechanism would in fact prove to be. For one thing, faced with a penalty on excess reserves, banks not finding any adequately yielding market instrument might endeavor to turn depositors away. It is unlikely that they would refuse deposits outright—because of long-run considerations. They might instead have recourse to service charges aiming at the same results. But this would still be a stabilizing influence for it would imply a negative return for holding money—a storage charge—which again would facilitate bringing market rates to very low or even negative levels and would encourage investments in real assets.

A great danger is the possibility that banks might artificially increase their deposits, in order to absorb excess reserves, by making fictitious loans to customers. It is impossible to predict just how widespread such a practice might become, what its effects might be, and how it could be prevented or limited. However, it hardly seems worthwhile to dwell on the issue of a penalty on excess reserves because, for the moment at least, the likelihood of short-term market yields being so low as to create real problems seems rather remote.

PROPOSAL FOR SPECIAL BORROWING FACILITIES AIMED AT IMPROVING THE SPATIAL ALLOCATION OF BANK CREDIT

This section describes in brief fashion a proposal for creation of special borrowing facilities, the purpose of which would be to improve the allocation of bank credit—that is, goal 4.

Proposal outlined

The reform sketched in the previous section would go a long way toward achieving the first three goals set forth in the first section. But it would do little toward goal 4—improvement of the spatial allocation of bank credit—except possibly insofar as it would tend to make more uniform across the banking system the cost of very short-term borrowing and the rate of return from very short-term lending.

In order to achieve goal 4 and as a further contribution to goal 3, I would like to advance a second proposal, the adoption of which, incidentally, would be largely independent of the implementation of the reform set forth in the previous section. The essence of the proposal is to set up a second discount window (hereinafter referred to as the “term window”)—one that would grant credit for an essentially fixed term, say 3 months, not repayable until maturity (except under special circumstances and/or with some appropriate penalty). The term window, too, would be open to any bank willing to pay the price, up to some limit determined by a creditworthiness standard. At the same time, lending conditions would again be structured so as to stabilize the amount of borrowing, making it independent of the level of short-term market yields or of other indicators of monetary stringency. But in contrast to the first window, which would be designed for minimum usage, the term window would be de-

signed to function as a *substitute for an interbank loan market*; to perform this function on an adequate scale, the volume of borrowing outstanding might have to be substantial.

A market for interbank lending seems to have developed only to a very limited extent, except for overnight lending in the FF market and through the correspondent banking system—a rather surprising phenomenon considering the large number of banks that make up the U.S. banking system. To be sure, a satisfactory spatial allocation of funds could be achieved even in the absence of interbank lending, if there were adequate devices by which banks could attract funds from “surplus” areas to “short” areas. But until rather recently such a possibility has been very much limited by the levels of ceiling rates on time deposits and the prohibition of interest payments on demand deposits. More recently, increases in ceilings on time deposit rates and the development of a market for CD's have presumably led to some improvements. But there is reason to believe that even these developments fall short of adequacy since the CD market is, in practice, accessible only to large, prime banks. The proposed term window could also be regarded as a device to extend to smaller banks facilities that are analogous to those provided by the CD market.

How the term window could contribute to allocative efficiency

Before inquiring how the terms of borrowing could be set so as to reconcile the goals of an open and extensively used window with that of a stable volume of loans outstanding, it would be well to ascertain in

what sense the existence of the term window could be expected to improve the spatial allocation of bank credit.

Basically, the answer lies in the consideration that a window open to all on the same terms would tend to equalize the opportunity cost of funds among banks, and hence presumably also the terms on which credit would be available to would-be borrowers. It might be argued that this uniformity already tends to prevail, in the sense that under the present system all banks have the opportunity to invest in a common set of market instruments, and—what is more important—they all do invest, by and large, in certain instruments such as Treasury bills. It would therefore appear that the Treasury bill rate represents the common opportunity cost for all banks. But this, in fact, is not a valid inference because such bills are held not merely for their cash income but also, in part at least, to satisfy liquidity requirements (as well as certain other requirements). One rather striking piece of evidence in support of this proposition is provided by the observation that many banks holding some bills in their portfolios have been willing to issue CD's at a significant premium over the rate on bills.

We must conclude then that, even though the cash yield is the same for all holders, the "total" yield, including the "liquidity" component, need not be the same. It follows that the opportunity cost of funds invested in other assets need not be the same for all banks, even if they all hold bills. In particular, one would expect that when banks are compared on the basis of the relation of their supply of funds for lending relative to their lending opportunities, the opportunity cost would be higher for banks with lower supply-to-demand ratios than for banks with higher ratios.

Under these conditions we might expect

that if banks that are relatively short of funds were enabled to borrow from banks with excess funds at a rate somewhat above the current bill rate they would, within some limits, tend to take advantage of this opportunity. The borrowing banks would then use the funds for expanding their loan portfolios (and possibly even their portfolios of short-term market instruments). For the lending bank the investment in the loan would presumably displace other assets, including some loans. And the redistribution of loans would presumably increase allocative efficiency.

The proposed term window would accomplish the same general result, although by a somewhat different route. Suppose the rate at the term window had been set somehow and that at this rate banks would borrow a certain volume of funds with which to expand their loans. In order to accommodate this demand, while keeping total reserves unchanged, the Federal Reserve would have to liquidate some of its portfolio of market instruments. This would raise market yields, thereby encouraging some banks—presumably those better supplied with funds—to acquire market instruments at the expense of their other investments, including loans. Thus, the final effect would be a redistribution of loans from more amply provided to less well-provided areas through a somewhat circuitous route. In other words, the surplus bank would choose as a substitute for direct loans to its regular customers not loans to the less well-supplied customers of other banks but rather market instruments such as Treasury bills; such purchases by the bank with surplus funds would enable the Federal Reserve to exchange securities for cash, which it would lend to the "short" bank, which in turn would use those funds to expand its loans.

It might be noted from the above that one implication of the proposed reform might well be an increase in the yield on market instruments, especially short-term ones such as bills. As is well known, this is an effect that typically tends to accompany any restructuring of the financial system, the result of which is more reliance on pure price rationing and less on other forms of rationing. It also follows from this analysis that the improvement in allocative efficiency one might expect from the proposed reform would depend on the views one had about the effectiveness of present arrangements for the spatial allocation of funds.

Operational aspects

Having thus laid out the basic argument in favor of a term window, we can take up the problem of how to achieve simultaneously an open window and a substantial and yet relatively stable volume of borrowing.

Abstracting for a moment from "practicality," one could readily suggest a device that would accomplish the desired aim. Specifically, one could auction off on a regular schedule, say every week, a block of funds equal to the volume of loans that would come due in that week, somewhat along the lines of the present bills auction.

This approach probably deserves consideration in the light of the experience gained with the bills auction. Major drawbacks might be (1) administrative complexity and (2) the fact that the auction might again give an edge to the larger banks, which are better equipped to participate in it. It is hard to say without further careful study how serious these shortcomings might be.

As an alternative, it may be possible to "simulate" closely an auction by a device similar to that suggested for the 1-day window: reset the borrowing rate at frequent

intervals—say, once a week—and tie that rate to a short-term market rate—say, the 3-month bill rate or the CD rate—with a flexible differential, one that increases as the volume of borrowing increases.

With this arrangement one could not altogether avoid some variations in the volume of borrowing, but the variations could be kept within moderate bounds. One important feature that would tend to insure this result is that the shrinkage in the volume outstanding in any given week could not exceed the amount reaching maturity. Assuming a 3-month maturity, this amount would be approximately 1/13 of the outstanding volume. Furthermore, since this window would not be designed as a device for meeting short-run reserve requirements (which would be handled through the 1-day window), it would be quite appropriate to require that applications for loans to be taken down in a given week be filed some time in advance. Under these conditions the Federal Reserve would know in advance how much variation in the volume of borrowing at the term window would occur in each week and could, if it wished, offset such variations by open market operations.

One could readily conceive of slightly more complex designs. For instance, the window could announce, say, 2 weeks in advance two or more possible rates and ask for preliminary applications at each of the indicated rates. On the basis of this information it could set a final rate 1 week in advance and could accept as final all applications received at that rate. In short, it should not prove too difficult to design a system that would minimize fluctuations in the volume of borrowing outstanding and that furthermore could offset any remaining fluctuations through open market policy. It should be noted in this connection that there is little reason to be concerned with

the danger that, in slack periods, the volume of borrowings would shrink beyond control. In fact, with a variable differential one could always go so far as to push the rate to a level below the bill rate, at which point the volume of borrowings would obviously become highly elastic because any bank could make a "hedged" profit by borrowing and using the proceeds to buy bills. (It is an open question whether under such conditions it would be preferable to let the borrowing shrink and to let the central bank purchase bills through open market operations.)

How large a target volume of borrowing?

It should be apparent from the preceding discussion that the smaller the target volume of borrowing, the easier the task of minimizing fluctuations in reserves caused by fluctuations in borrowings at the proposed term window. But it should be equally apparent that keeping the volume of borrowing low would reduce the effectiveness of the proposal in achieving a better spatial allocation of bank credit.

To see how far these goals might be reconciled we might first ask this question: If one neglects the problem of stabilizing borrowing, how large a volume of borrowing at the term window might, in the long run, be optimal? An answer to this question might be obtained by pursuing the idea that for smaller banks the term window should provide an alternative to the CD market. This criterion suggests the following answer: The volume of borrowing should be such that the rate necessary to induce it would be somewhat above prevailing CD rates for a maturity comparable to that offered at the window.

To understand the rationale for the suggested criterion, we may first note that a term-window rate close to the CD rate

would tend to equalize roughly the opportunity cost of funds for all banks that were issuing CD's and/or using the window. To be sure, for banks not using either device the opportunity cost could be lower, presumably as low as the bill rate. However, since CD rates have tended, at least so far, to stay reasonably close to the bill rate, the difference in opportunity costs would remain within modest limits. At the same time it should be recognized that a lower rate at the term window would hardly be feasible, unless the window were somehow closed to banks issuing CD's—which would seem quite undesirable and even inconsistent with the spirit of the proposal. The reason is that, with a completely open window, the borrowing rate would tend to set a ceiling on the CD rate. Or to look at this from a different angle, the demand for borrowing at the term window might be expected to become very elastic as the rate approached the CD rate.

These considerations suggest an operational and pragmatic approach toward the development of the term window. Suppose the Federal Reserve started out with a fairly modest target, say around \$2 billion to \$3 billion, which would imply a weekly turnover of \$150 million to \$200 million. If it then turned out that the rate needed to clear that volume of borrowing were on the average substantially above the CD rate, one could make two inferences: (1) that the window seemed to be contributing significantly to an improved allocation, filling a function not performed by present institutions (this inference could of course be further tested by examining the distribution of borrowing among banks and the apparent use made of the marginal funds acquired); and (2) that there was a prima-facie case for moving in the direction of increasing the target. It would then be pos-

sible to plan to have such an expansion occur gradually over time as experience was gained with operation of the window and with problems that might conceivably arise.

If on the other hand, even with a modest target, one should find that the rate tended to hover close to the CD rate and that the window was being used by banks that could have issued CD's, then one could infer that the target should be reduced, or even that the reform was contributing so little to the improvement of the system as to justify abandoning it.

Some minor complementary suggestions

1. It would seem appropriate to make the term window available only to banks that are members of the Federal Reserve System. This limited-availability feature, when coupled with the payment of interest on excess reserves (and a graduated system of reserve requirements), could go some distance toward providing an incentive for nonmember banks to become members,

contributing to a better control of the money supply and short-term market rates.

2. One could relax the requirement that all borrowing at the window be for a single fixed term and allow some choice of terms, say between 2 and 6 months. The rate for such loans could be tied to rates for the corresponding maturities on the chosen market instruments, be it CD's or bills, through a single differential applied to all maturities. However, this greater flexibility would complicate the task of stabilizing the volume of loans maturing in any given week. It is not clear that this refinement is worth the cost since banks could presumably manage, through other transactions in short-term markets, to reconcile a fixed-term borrowing with their requirements. If the volume of borrowing at the window were sufficiently large, one might, as an alternative, conceive of developing some sort of secondary market, with or without the participation of the Federal Reserve.

AN EVALUATION OF SOME DETERMINANTS OF MEMBER BANK BORROWING

Leslie M. Alperstein

Board of Governors of the Federal Reserve System

Contents

Summary of Findings and Conclusions	80
Design of the Study	82
Data	
Description of explanatory variables	
Results	83
Cross-sectional analysis	
Time-series analysis	

AN EVALUATION OF SOME DETERMINANTS OF MEMBER BANK BORROWING

The major focus of this paper is to identify the determinants of member bank borrowing and to measure the relationships that exist among these determinants. Regression analysis is used to contrast various forms of borrowing from the Federal Reserve with borrowing from sources other than the Federal Reserve. The methodology was selected so that it would be possible to assign measurable weights to the casual factors felt to be most responsible for borrowing and then to compare for differences in the ability of these factors to explain variations in borrowing from alternative sources.

It is becoming increasingly clear that the distribution of financial assets throughout the banking system can materially affect the speed and effectiveness of a given monetary policy. Banks of various sizes may be expected to respond differently over the business cycle to changes in financial variables such as liquidity and interest rates. To the extent that banks react to fluctuating credit conditions by adjusting their liquidity positions, they can affect to a significant degree the amount of borrowing and credit expansion that takes place. Consequently, both bank size and liquidity are examined in this paper and tested for their significance in explaining different types of borrowing.

Insofar as the structural characteristics of banks that borrow from the Federal Reserve influence the degree to which they

borrow, sensitivity to interest rates has traditionally been a popular determinant. The literature from time to time has reflected discussions, both theoretical and empirical, on the influences of interest rate spreads on banks' sensitivity to borrowing. Interest rates are examined closely for their influence upon borrowing per se, as well as for their degree of interaction with other determinants of borrowing.

A discussion dating back only a few years centered around the effects on member bank borrowing of possible differences in the administration of the discount window among the various Federal Reserve districts. In order to facilitate a closer look at this problem, an attempt is made to distinguish between supply and demand factors in determining borrowing among several Federal Reserve districts.

The variables tested for their significance in explaining borrowing from the Federal Reserve and borrowing from other sources were: (1) a liquidity ratio, designed to reflect the banks' ability to meet loan demands and unexpected deposit withdrawals out of internally generated short-term assets; (2) an interest rate differential between the discount rate and the 3-month Treasury bill rate, to reflect the impact of banks' response to least-cost considerations; (3) the size of the bank, to indicate differences in the likelihood that some banks,

for example those associated with financial centers, might be less reluctant than others to borrow from the Federal Reserve; and (4) Federal Reserve district, to shed light on the problem of alleged differences in the administration of the discount window.

To lessen the degree to which the statistical results would be affected by problems associated with aggregated data, the initial part of the study examined the borrowing behavior of individual banks. Tests were made on weekly reporting member banks for six Federal Reserve districts during the period July 1959 to October 1961.

The tests were divided into two parts:

SUMMARY OF FINDINGS AND CONCLUSIONS

The results of the cross sections and the time-series regressions suggest that the liquidity condition of a bank's short-term asset portfolio, as well as the interest differential between the discount rate and the bill rate, contributed significantly toward explaining variations in borrowing. Of the two factors, liquidity had a greater impact on borrowing in all of the periods studied; but in those periods when the discount rate was less than the bill rate, the importance of liquidity as an explanatory factor diminished somewhat in favor of the interest-differential factor.

The behavior of the liquidity and interest-differential variables supports the least-cost hypothesis; that is, that banks, in general, are sensitive to interest rate differentials to the extent that they will borrow from the least expensive source even when that source is the Federal Reserve. In the period when the bill rate exceeded the discount rate, the ability of the bank liquidity variable to explain the likelihood of indebtedness to the Federal Reserve was only about half as great as when the discount rate exceeded the bill rate. This suggests that banks are

cross-sectional analyses and time-series analyses. The cross sections estimated the relationship between the likelihood of borrowing by a particular bank and factors associated with its indebtedness. Additional cross sections estimated the relationship between the frequency of borrowing from the Federal Reserve and the postulated determinants of borrowing.

The time-series regressions estimated the relationship between borrowing and the independent variables—liquidity, size, and district—and then with the addition of the temporal variable, the interest rate differential.

less reluctant to borrow from the Federal Reserve when it is the least expensive alternative source of funds.

During the period studied, banks borrowed more often when it was profitable to do so. The frequency of borrowing from the Federal Reserve was negatively associated with liquidity, corroborating the results of the conditional probability estimates. Banks with relatively higher levels of liquidity were more likely to borrow, and borrow more often, from the Federal Reserve when the bill rate exceeded the discount rate. The cross sections demonstrated that in the period when the bill rate exceeded the discount rate ($rb > rd$) banks were less willing to sell Treasury bills as a secondary source of reserves and shifted instead to the Federal Reserve.

The time-series regressions supported the inferences made from the cross-sectional analysis. When the interest rate differential was explicitly included in the regressions, banks were found to be sensitive to variations in the interest rate spread as well as to variations in liquidity levels. Inasmuch as aggregate data can sometimes mask the ef-

fects of microrelations, it is not immediately clear whether the variations in relative amounts of borrowing were being caused by the same number of banks borrowing greater amounts, the same number of banks borrowing the same amounts but more often, or fewer banks borrowing greater amounts. To distinguish between these effects, an estimate was made of the *proportion* of banks in each Federal Reserve district that were borrowing over time. The results indicated that the number of banks per district as well as the relative amounts of borrowing from the Federal Reserve increased when the discount rate was the least-cost alternative.

On the basis of the regression results, it was concluded that for the period studied the incentive of banks to borrow stemmed from the liquidity condition of their short-term assets as well as, and to a lesser extent, the profitability of borrowing. It cannot be concluded from these results that banks borrow from the Federal Reserve to reinvest in short-term Government securities. It was demonstrated that Treasury bills were liquidated in periods when the bill rate exceeded the discount rate. The results would have been the reverse if banks had been engaged in "profiteering."

Among the other determinants, bank size was shown to have a significant, although uncertain, effect on borrowing from the Federal Reserve. Although considerable differences were found to exist among banks of varying sizes with respect to their likelihood, as well as to their frequency, of borrowing, no discernible pattern emerged among size groups. Borrowing from other sources, however, was found to increase with size, a result which was not unexpected.

There were variations among Federal Reserve districts in relative amounts of borrowing from the Federal Reserve, in the

proportion of banks borrowing, and in the frequency of borrowing per bank. These results suggest the existence of other causal factors not explicitly considered, such as those with characteristics of demand or supply.

If nonuniformities in the administration of the discount function were responsible for the disparate pattern of borrowing among districts, this pattern would be expected to differ substantially from a market in which nonprice rationing was nonexistent. Banks are not precluded from borrowing elsewhere, for example the Federal funds market, on grounds other than price constraints or smallness of transaction. Therefore, the patterns of *ex post* borrowing among districts between a price-determining market and the discount window would differ to the extent that funds were more accessible at some discount windows by virtue of easier lending policies. Although the six districts differed substantially with respect to borrowing from the Federal Reserve after liquidity and cost were taken into account, there was a similarity in the borrowing for each district by type of borrowing. The cross-sectional findings indicated that roughly the same patterns of borrowing existed among Federal Reserve districts for borrowing from the Federal Reserve and for borrowing from other sources. The time-series analyses indicated that the patterns of borrowing were precisely the same after taking into account the liquidity condition of the district as a whole and the interest rate differential.

This does not prove that supply factors are of no importance in the determination of differences in borrowing among districts, but rather that for the period of time covered and the districts involved, differences in demand explained to some degree the importance of the Federal Reserve district as a determinant of borrowing.

DESIGN OF THE STUDY

Data

The sample consisted of nearly all weekly reporting member banks in the six Federal Reserve districts for which adequate data were available: Boston, Richmond, St. Louis, Minneapolis, Dallas, and San Francisco. Banks for which complete records were not available for one reason or another were dropped from the sample. The Bank of America was dropped because it was believed that this bank was not of the same nature as the other banks in the sample and, because of its size, might bias the results.

Each bank was checked for changes in structure. Banks that merged during the period July 1959 to October 1961 were deleted. When the sample of banks was finally completed, the raw data from the weekly balance sheets were averaged for 2-week periods, giving 35 biweekly observations for each of the 143 banks.

Information on interest rates was obtained from the Federal Reserve *Bulletin* and from Section 12 of the *Supplement to Banking and Monetary Statistics*, 1966. Special calculations required for weekly averages of daily figures on 3-month Treasury bill rates were made available by the Government Finance Section of the Board's Division of Research and Statistics.

Description of explanatory variables

The variables used to explain the various forms in which borrowing is presented include the following:

LQ , measure of a bank's liquidity

where $LQ =$ the ratio of: (Loans to domestic commercial banks + Loans to brokers and dealers for purchasing or carrying other securities + Treasury bills + Currency and

coin + Balances in banks in the United States — Borrowing from the Federal Reserve — Lagged borrowing from others) to (Demand deposits adjusted + Time deposits — Required reserves).

The approach taken in this study is to regard the maintenance of good banker-customer relationships as the deciding factor in assessing the short-run "needs" or liquidity of the bank. Accordingly, bankers will alter their optimum asset portfolio in order to accommodate customers who they feel have long-run profit potentials outweighing current considerations.

P , measure of the cost of borrowing from the Federal Reserve in contrast to borrowing from other sources

where $P = (rd - rb)$, $rd =$ the discount rate, and $rb =$ Treasury bill rate. When $(rd - rb)$ is negative, there is a negative cost associated with borrowing from the Federal Reserve.

L_i , measure of the bank's demand deposit size

where $L_1 =$ under \$25 million; $L_2 =$ \$25 million to \$50 million; $L_3 =$ \$50 million to \$100 million; $L_4 =$ \$100 million to \$300 million; $L_5 =$ over \$300 million.

In the regressions, the L_i 's are represented by dummy variables.

C , dummy variable indicating the bank's reserve classification

where reserve city banks were assigned a value of 1 for variable C , country banks were given a value of 0.

D_i , dummy variables representing the six reserve districts

where $D_1 =$ Boston; $D_5 =$ Richmond; $D_8 =$ St. Louis; $D_9 =$ Minneapolis; $D_{11} =$ Dallas; $D_{12} =$ San Francisco.

RESULTS

Cross-sectional analysis

Ordinary least-square regressions were used to ascertain if, and to what extent, a relationship existed between a bank's borrowing from the Federal Reserve and such characteristics as size of bank, Federal Reserve district, and the liquidity position of the asset portfolio. The conditional probability estimates predicted the likelihood of nonzero borrowing. In addition, they served to indicate the nature of the relationship between the independent variables and the likelihood of borrowing; that is, would banks in one particular district be more likely to borrow than those in another.

Likelihood of indebtedness. Four cross sections were taken: two for dates when the Treasury bill rate was greater than the discount rate—August 19, 1959, and December 23, 1959—and two for dates when the bill rate was less than the discount rate—July 22, 1959, and March 16, 1960. Estimates were made for the likelihood of borrowing from the Federal Reserve (B_f) and from other sources (B_o). The final equations for the conditional probability estimates were:¹

July 22, 1959

$$(1) B_f = .549 - .353(D_1)^* \\ (.439) \quad (.141) \\ - .203(D_8) + .039(D_9) - .115(D_{11}) \\ (.140) \quad (.160) \quad (.137) \\ - .224(D_{12}) + .256(L_2)^* + .108(L_3) \\ (.141) \quad (.107) \quad (.121) \\ + .194(L_4) + .015(L_5) - .001(LQ)^* \\ (.116) \quad (.161) \quad (.000)$$

$$R^2 = .203, F = 3.352^\dagger$$

¹ In all of the equations * indicates significant at .05 level of confidence and † indicates significant at .01 level of confidence. Standard errors are in parentheses.

August 19, 1959

$$(2) B_f = .195 - .110(D_1) \\ (.370) \quad (.119) \\ - .088(D_8) + .208(D_9) + .017(D_{11}) \\ (.118) \quad (.136) \quad (.116) \\ - .084(D_{12}) + .224(L_2)^* + .126(L_3) \\ (.121) \quad (.090) \quad (.100) \\ + .153(L_4) - .074(L_5) - .001(LQ)^* \\ (.093) \quad (.145) \quad (.000)$$

$$R^2 = .152, F = 2.360^*$$

December 23, 1959

$$(3) B_f = .313 - .105(D_1) \\ (.402) \quad (.128) \\ - .031(D_8) - .001(D_9) - .066(D_{11}) \\ (.129) \quad (.144) \quad (.125) \\ - .129(D_{12}) + .073(L_2) + .030(L_3) \\ (.130) \quad (.097) \quad (.111) \\ + .147(L_4) - .154(L_5) - .001(LQ)^* \\ (.400) \quad (.149) \quad (.000)$$

$$R^2 = .079, F = 1.126$$

March 16, 1960

$$(4) B_f = .624 - .236(D_1) - .154(D_8) \\ (.465) \quad (.149) \quad (.150) \\ - .058(D_9) - .038(D_{11}) - .184(D_{12}) \\ (.170) \quad (.147) \quad (.154) \\ + .052(L_2) + .087(L_3) - .065(L_4) \\ (.110) \quad (.130) \quad (.117) \\ + .122(L_5) - .002(LQ)^* \\ (.206) \quad (.000)$$

$$R^2 = .113, F = 1.674$$

July 22, 1959

$$(5) B_o = .399 - .054(D_1) - .099(D_8) \\ (.422) \quad (.135) \quad (.135) \\ + .180(D_9) - .024(D_{11}) - .235(D_{12}) \\ (.155) \quad (.132) \quad (.137) \\ + .226(L_2)^* + .251(L_3)^* + .493(L_4)^\dagger \\ (.102) \quad (.116) \quad (.112) \\ + .533(L_5)^* - .002(LQ)^* \\ (.155) \quad (.000)$$

$$R^2 = .317, F = 6.121^\dagger$$

August 19, 1959

$$\begin{aligned}
 (6) \ B_o &= .388 + .033(D_1) - .022(D_8) \\
 &\quad (.392) \quad (.126) \quad (.125) \\
 &+ .207(D_9) + .024(D_{11}) - .175(D_{12}) \\
 &\quad (.143) \quad (.123) \quad (.128) \\
 + .273(L_2)^* &+ .279(L_3)^* + .595(L_4)^\dagger \\
 &\quad (.095) \quad (.106) \quad (.099) \\
 &+ .609(L_5)^* - .002(LQ)^* \\
 &\quad (.154) \quad (.000)
 \end{aligned}$$

$$R^2 = .404, F = 8.934^\dagger$$

December 23, 1959

$$\begin{aligned}
 (7) \ B_o &= .144 - .022(D_1) + .122(D_8) \\
 &\quad (.384) \quad (.123) \quad (.123) \\
 &+ .236(D_9) + .020(D_{11}) + .077(D_{12}) \\
 &\quad (.137) \quad (.120) \quad (.126) \\
 + .374(L_2)^\dagger &+ .189(L_3) + .680(L_4)^\dagger \\
 &\quad (.093) \quad (.103) \quad (.094) \\
 &+ .491(L_5)^* - .001(LQ)^* \\
 &\quad (.153) \quad (.000)
 \end{aligned}$$

$$R^2 = .407, F = 9.071^\dagger$$

March 16, 1960

$$\begin{aligned}
 (8) \ B_o &= .365 - .106(D_1) - .017(D_8) \\
 &\quad (.379) \quad (.121) \quad (.121) \\
 &+ .004(D_9) - .008(D_{11}) - .098(D_{12}) \\
 &\quad (.138) \quad (.121) \quad (.123) \\
 + .260(L_2)^\dagger &+ .409(L_3)^\dagger + .572(L_4)^\dagger \\
 &\quad (.091) \quad (.104) \quad (.095) \\
 &+ .706(L_5)^\dagger - .002(LQ)^* \\
 &\quad (.157) \quad (.000)
 \end{aligned}$$

$$R^2 = .442, F = 10.484^\dagger$$

Of the eight regressions, six revealed the presence of debt as being significantly related to the three characteristics: size, district, and liquidity. On each date borrowing from other sources was more fully explained by the independent variables than was borrowing from the Federal Reserve. This was to be expected, however, as certain unobservable variables would affect borrowing from the Federal Reserve in a different way than borrowing from other sources. For instance, an ostensibly important factor, the profit

spread, has not been considered explicitly. Differences in the availability of funds from the discount window in contrast to other sources would also affect the ability of the independent variables to explain borrowing. It is inferred, therefore, that the relatively lower R^2 's for borrowing from the Federal Reserve are explained at least in part by factors that constrain borrowing from the Federal Reserve but not borrowing from other sources; to wit, reluctance to borrow and availability of supply.

In the two equations that showed a significant relationship between borrowing from the Federal Reserve and the factors determining the likelihood of borrowing, each of the variables was tested to determine its net contribution in explaining the total variation in indebtedness. The partial relationships for borrowing from the Federal Reserve and borrowing from other sources are given in Table 1. These partial relationships indicate the amount of explanation contributed by the addition of the factor considered.

All three variables—liquidity, district, and size—were found to contribute to the explanation of borrowing. Worth noting are the differences in impact of the independent factors on borrowing from the Federal Reserve in contrast to borrowing from other sources.

In terms of the size of the partial coefficient of determination, the Federal Reserve district made the largest contribution to the explained variation in borrowing from the Federal Reserve. By comparison, the district played a much smaller role in borrowing from other sources, while size explained most of the variation. On August 19, 1959, when the bill rate was greater than the discount rate indicating that banks could borrow more cheaply at the discount window, the partial correlation coefficient for the

TABLE 1

PARTIAL RELATIONSHIPS OF CONDITIONAL PROBABILITY ESTIMATES OF BORROWING FROM THE FEDERAL RESERVE AND FROM OTHER SOURCES¹

Variables in regression	Added variable	Partial coefficient of determination	
		Federal Reserve	Other sources
July 22, 1959			
D_i	L_i	.065 (2.32)*	.214 (9.04)†
L_i	D_i	.010 (2.66)†	.092 (2.69)†
D_i	LQ	.083 (12.29)†	.163 (26.38)†
L_i	LQ	.082 (12.18)†	.011 (16.55)†
D_i, LQ	L_i	.052 (1.82)	.146 (5.60)†
L_i, LQ	D_i	.080 (2.28)*	.071 (2.00)*
D_i, L_i	LQ	.070 (9.93)†	.089 (12.94)†
Aug. 19, 1959			
D_i	L_i	.061 (2.16)*	.272 (12.40)†
L_i	D_i	.079 (2.28)*	.095 (2.79)†
D_i	LQ	.029 (4.06)†	.186 (31.02)†
L_i	LQ	.041 (1.57)	.168 (27.70)†
D_i, LQ	L_i	.062 (2.19)*	.232 (9.96)†
L_i, LQ	D_i	.068 (1.93)*	.066 (1.86)
D_i, L_i	LQ	.030 (6.08)†	.014 (21.70)†

¹ *F*-ratios are in parentheses.

* indicates significant at 0.05 level of confidence.

† indicates significant at 0.01 level of confidence.

liquidity variable dropped more than 50 per cent of the value that had prevailed when the bill rate was less than the discount rate.

The finding that less importance is attributed to liquidity considerations when borrowing from the Federal Reserve is profitable lends support to the least-cost hypothesis.

Borrowing from other sources was influenced very little by liquidity when the bill rate was greater than the discount rate, indicating that banks are sensitive to changes in interest rate differentials. During this period, the bill rate was also greater than the rate on Federal funds, and so it is likely that banks tended to absorb Treasury bills by meeting liquidity considerations through the Federal funds market. This hypothesis is supported by the behavior of the size variable. During the period when

the bill rate was low in relation to other rates, the partial coefficient for size was 0.146 and significant at the 1 per cent level. When the bill rate was relatively high, the larger banks were less reluctant to borrow, as indicated by the increase in the partial correlation coefficient to 0.232, significant at the 1 per cent level.²

Comparisons by reserve districts between borrowing from the Federal Reserve and from others. The most interesting finding with respect to the determinants of borrowing was the behavior of the variables for Federal Reserve districts. It has been argued that there are differences in borrowing among districts and that these differences reflect nonuniformities in the administration of the discount window. If the different borrowing patterns that emerge among districts could be attributed to nonuniform administration of the discount window, the patterns of borrowing from the Federal Reserve would differ among districts from borrowing from other sources. On the other hand, if differences in demand as distinct from differences in supply, were responsible for the borrowing patterns that emerged, the patterns of borrowing among districts would be similar for both types of borrowing.

In Table 2, the districts have been ranked in order of the likelihood of borrowing from the Federal Reserve and from other sources. The order was obtained from the regressions and derived from the coefficient attached to the district variables. A negative district coefficient in the regressions places the district below D_5 (Richmond was the base district in the regression) in Table 2. Banks located in the district with the largest negative value on a given date show the least probability of borrowing. Banks in the

² The assertion that borrowing from other sources is functionally related to size is explained more fully later.

TABLE 2

DISTRICTS RANKED BY LIKELIHOOD OF BANKS BORROWING FROM THE FEDERAL RESERVE AND FROM OTHER SOURCES

Order	July 22, 1959		Aug. 19, 1959		Dec. 23, 1959		Mar. 16, 1960	
	B_f	B_o	B_f	B_o	B_f	B_o	B_f	B_o
1	D_1	D_{12}	D_1	D_{12}	D_{12}	D_1	D_1	D_1
2	D_{12}	D_8	D_8	D_8	D_1	D_5	D_{12}	D_{12}
3	D_8	D_1	D_{13}	D_5	D_{11}	D_{11}	D_8	D_8
4	D_{11}	D_{11}	D_5	D_{11}	D_8	D_{12}	D_9	D_{11}
5	D_5	D_5	D_{11}	D_1	D_9	D_8	D_{11}	D_5
6	D_9	D_9	D_9	D_9	D_5	D_9	D_5	D_9

NOTE. — Order is from least likely to most likely to borrow.

district with the largest positive value show the greatest probability of being in debt.

The comparative likelihoods of borrowing from the Federal Reserve (B_f) and of borrowing from other sources (B_o) are roughly similar.

For July 22, 1959, only D_1 differed in its ranking among the six districts borrowing from the Federal Reserve and borrowing from other sources. On August 19, 1959, D_1 and D_{12} changed position while on December 23, 1959, D_5 and D_{12} changed their order of rank. On March 15, 1960, only D_9 changed its rank between B_f and B_o .

Had the patterns of borrowing among districts differed by *type* of borrowing, one might conclude that some discount windows are more accessible than others. However, since the patterns are roughly the same between borrowing from the Federal Reserve and from other sources, it remains only to explain differences in the demand borrowing among districts. There are, no doubt, a number of conceivable explanations, one

of which is the possibility that the liquidity variable does not accurately reflect the demands for credit in the various Federal Reserve districts.

Relationship between size of bank and borrowing. A comparison by size of bank was made for borrowing from the Federal Reserve and borrowing from other sources. The order of comparison is shown in Table 3 where the banks by size are listed from least likely to most likely to be in debt.

There appears to be a strong functional relationship between size of bank and borrowing from other sources. For each date except December 23, 1959, the likelihood of a bank's indebtedness was an increasing function of size. These results were not unexpected for as credit tightens, smaller banks draw down balances with their larger correspondent banks—shifting the burden of liquidity to them. The larger, more aggressive banks usually carry smaller relative quantities of excess reserves and therefore would be expected to borrow more.

In contrast to borrowing from other

TABLE 3

BANK SIZE RANKED BY LIKELIHOOD OF BORROWING FROM THE FEDERAL RESERVE AND FROM OTHER SOURCES

Order	July 22, 1959		Aug. 19, 1959		Dec. 23, 1959		Mar. 16, 1960	
	B_f	B_o	B_f	B_o	B_f	B_o	B_f	B_o
1	L_1	L_1	L_5	L_1	L_5	L_1	L_4	L_1
2	L_5	L_2	L_1	L_2	L_1	L_3	L_1	L_2
3	L_3	L_3	L_3	L_3	L_3	L_2	L_1	L_3
4	L_4	L_4	L_4	L_4	L_2	L_5	L_3	L_4
5	L_2	L_5	L_2	L_5	L_4	L_4	L_5	L_5

NOTE. — Order is from least likely to most likely to borrow.

sources, borrowing from the Federal Reserve showed considerably less association with size of bank. On August 19, 1959, and December 23, 1959, the largest banks were less likely to borrow than the smallest banks, as reflected in Table 3. Borrowing from the Federal Reserve, unlike borrowing from other sources, is neither anticipated nor orderly. It is more spontaneous, and consequently would be expected to show a less discernible pattern.

Frequency of borrowing at the discount window. Cross-sectional regressions were used to estimate the relationship between the frequency of borrowing from the Federal Reserve and the variables that had been used to estimate the likelihood of indebtedness, with the addition of a reserve classification variable (C).

The period from July 8, 1959, to November 2, 1960, was divided into three subperiods. The subperiods were chosen to emphasize patterns of borrowing when the relationship between the bill rate and the discount rate differed. In particular, all individual bank data were aggregated to provide totals for the subperiod when the discount rate was above the bill rate. A second aggregation covered the subperiod when the bill rate was greater than the discount rate; the third aggregation covered the entire period.

District, size, class, and liquidity variables were used to explain variations in the frequency of borrowing by banks in each of the designated subperiods. The frequency of borrowing from the Federal Reserve (F_f) represented the number of weeks that a given bank was indebted during the subperiod considered. A weekly average was made of the data within each subperiod.

For the entire period, July 8, 1959, to November 2, 1960, frequency of borrowing from the Federal Reserve was estimated by:

$$(9) F_f = 14.575 - 1.398(D_1) \\ (8.882) \quad (2.950) \\ - 1.767(D_8) + 5.194(D_9) \\ (2.872) \quad (3.288) \\ - 2.337(D_{11}) - 6.611(D_{12})^* \\ (2.817) \quad (2.950) \\ - 4.151(C)^* + 5.399(L_2)^* \\ (1.805) \quad (2.144) \\ + 4.050(L_3)^* + 2.073(L_4) \\ (2.498) \quad (2.398) \\ + 2.362(L_5) - .030(LQ)^* \\ (3.741) \quad (.012)$$

$$R^2 = .209, F = 3.144^\dagger$$

In order to examine the effects of holding short-term Treasury bills, the variable T was substituted for LQ in equation 10.

$$(10) F_f = 9.768 - .221(D_1) \\ (8.874) \quad (2.984) \\ - 1.640(D_8) + 7.104(D_9)^* \\ (3.209) \quad (2.784) \\ - 2.890(D_{11}) - 5.138(D_{12})^* \\ (2.893) \quad (2.893) \\ - 4.110(C)^* + 5.488(L_2)^* \\ (1.801) \quad (2.145) \\ + 5.157(L_3)^* + 5.440(L_4)^* \\ (2.506) \quad (2.384) \\ - 10.371(L_5)^* - .055(T)^* \\ (4.351) \quad (.022)$$

$$R^2 = .210, F = 3.169^*$$

From August 19, 1959, to March 2, 1960, when the bill rate was above the discount rate, the estimating equation was able to explain to a lesser extent the variation in F_f . In particular:

$$(11) F_f = 5.649 + .444(D_1) \\ (5.009) \quad (1.671) \\ + .904(D_8) + 3.059(D_9)^* \\ (1.616) \quad (1.834) \\ + .352(D_{11}) - 2.157(D_{12}) \\ (1.583) \quad (1.636) \\ - 1.440(C) + 2.852(L_2)^* \\ (1.015) \quad (1.223)$$

$$\begin{aligned}
 & + 2.326(L_3)^* + 1.335(L_4) \\
 & \quad (1.364) \quad (1.334) \\
 & + 1.498(L_5) - .016(LQ)^* \\
 & \quad (2.149) \quad (.006)
 \end{aligned}$$

$$R^2 = .153, F = 2.149^*$$

$$\begin{aligned}
 (12) F_f = & 2.897 + .753(D_1) \\
 & (5.071) \quad (1.723) \\
 & + .769(D_8) + 3.954(D_9)^* \\
 & \quad (1.635) \quad (1.830) \\
 - & .147(D_{11}) - 1.492(D_{12}) - 1.201(C) \\
 & (1.584) \quad (1.639) \quad (1.019) \\
 & + 2.995(L_2)^* + 2.735(L_3)^* \\
 & \quad (1.240) \quad (1.385) \\
 & + 2.889(L_4)^* + 4.984(L_5)^* \\
 & \quad (1.337) \quad (2.433) \\
 & \quad - .019(T)^* \\
 & \quad \quad (.009)
 \end{aligned}$$

$$R^2 = .132, F = 1.805$$

In the subperiod when the discount rate (*rd*) was greater than the bill rate (*rb*), the estimating equations using *LQ* and *T* were:

$$\begin{aligned}
 (13) F_f = & 10.257 - 1.798(D_1) \\
 & (5.046) \quad (1.679) \\
 - & 2.382(D_8) + 1.809(D_9) - 2.270(D_{11}) \\
 & (1.630) \quad (1.823) \quad (1.599) \\
 & - 4.909(D_{12})^* - 2.843(C)^* \\
 & \quad (1.680) \quad (1.022) \\
 + & 2.363(L_2)^* + 1.971(L_3) + .220(L_4) \\
 & (1.219) \quad (1.420) \quad (1.362) \\
 & + .734(L_5) - .022(LQ)^* \\
 & \quad (2.129) \quad (.007)
 \end{aligned}$$

$$R^2 = .241, F = 3.792^\dagger$$

$$\begin{aligned}
 (14) F_f = & 6.764 - 1.135(D_1) \\
 & (5.126) \quad (1.709) \\
 - & 2.365(D_8) + 3.219(D_9) - 2.741(D_{11}) \\
 & (1.657) \quad (1.853) \quad (1.609) \\
 & - 3.744(D_{12})^* - 2.795(C)^* \\
 & \quad (1.671) \quad (1.041) \\
 + & 2.309(L_2)^* + 2.618(L_3) + 2.338(L_4) \\
 & (1.240) \quad (1.444) \quad (1.374) \\
 & + 5.394(L_5)^* - .031(T)^* \\
 & \quad (2.483) \quad (.014)
 \end{aligned}$$

$$R^2 = .217, F = 3.306^*$$

The cross-sectional regressions suggest that the frequency with which a bank borrows from the Federal Reserve is related to its size, reserve district, portfolio of liquid assets, and perhaps its reserve classification. A compact arrangement of the variable coefficients is presented in Table 4.

In all three subperiods there was a significant association between liquidity and frequency of borrowing from the Federal Reserve. When the bill rate was greater than the discount rate ($rb > rd$), liquidity became less important as a determinant of frequency. In contrast, when *rd* was greater than *rb*, a smaller drop in the level of liquidity prompted an increase in the frequency of borrowing.

The movements in Treasury bills showed much the same pattern as liquidity. Although movements in bills were inversely related to frequency in every subperiod,

TABLE 4

FREQUENCY OF BORROWING FROM FEDERAL RESERVE

By district, size, reserve classification, liquidity, and Treasury bills held

Period	Equation	Constant	D_1	D_8	D_9	D_{11}	D_{12}
Entire	9	14.575 (8.882)	-1.398 (2.950)	-1.767 (2.873)	5.194 (3.288)	-2.337 (2.817)	-6.611* (2.950)
	10	9.768 (8.874)	-.221 (2.984)	-1.641 (2.873)	7.104* (3.209)	-2.890 (2.784)	-5.138* (2.894)
When <i>rb</i> > <i>rd</i>	11	5.649 (5.009)	.444 (1.671)	.940 (1.616)	3.059 (1.834)	.352 (1.583)	-2.157 (1.636)
	12	2.897 (5.071)	.753 (1.723)	.769 (1.635)	3.954* (1.830)	-.147 (1.584)	-1.492 (1.639)
When <i>rd</i> > <i>rb</i>	13	10.257* (5.046)	-1.798 (1.679)	-2.382 (1.630)	1.809 (1.873)	-2.270 (1.599)	-4.909† (1.680)
	14	6.764 (5.126)	-1.135 (1.709)	-2.365 (1.657)	3.218 (1.853)	-2.741 (1.609)	-3.744* (1.672)

* indicates significant at 0.05 level of confidence.

† indicates significant at 0.01 level of confidence.

banks were less willing to reduce holdings of bills when their yield exceeded the cost of funds at the discount window. This finding supports the hypothesis that banks adjust reserves in accordance with the least-cost alternative; that is, banks with low levels of liquidity chose to borrow more often at the Federal Reserve when it was the least expensive source of funds. When the discount rate exceeded the bill rate ($rd > rb$), the frequency of borrowing was related to larger swings in holdings of bills, and banks displayed a greater willingness to liquidate bills rather than borrow from the more costly discount window.

The regressions explained less of the variation in the frequency of borrowing when the yield on Treasury bills exceeded the discount rate. Two reasons for this may be cited. First, the exclusion of the price variable reflects more importance when the bill rate is greater than the discount rate. Least-cost considerations demonstrate their impact during this time at the expense of liquidity considerations. It appears, then, that banks are more inclined to borrow from the Federal Reserve when it is least costly. Consequently, the reduction in liquidity, which has been shown to be a significant factor in determining borrowing, reduces the explanatory power of the equation when the bill rate is greater than the discount rate.

The second reason for the lower explanatory values concerns the element of control over borrowing at the discount window. As the bill rate rises relative to the discount rate, discount officers must remain alert to the potential for banks to take advantage of the interest rate differential. As administrative factors and, therefore, unspecified supply factors increase in importance, the demand factors are less able to explain the variations that occur in the frequency of borrowing from the Federal Reserve.

Time-series analysis

The inclusion of the price variable $P = (rd - rb)$ in a time-series analysis substantiated a large part of what was suggested by the cross-sectional analysis. The results of the test indicate that both liquidity and relative prices play significant roles in the amounts of borrowing that banks, on balance, will wish to undertake and that these relative amounts differ among Federal Reserve districts.

The objective of the time-series was to observe over time the effect of liquidity, district, and cost on the patterns of borrowing. In order to do this, the cross-sectional variable for the reserve district had to be pooled with the temporal variable P . The procedure was to aggregate all banks within each district for each date; this provided six district observations for each of the 35 dates, or a

L_2	L_3	L_4	L_5	C	LQ	T	R^2
5.399* (2.144)	4.050 (2.498)	2.073 (2.398)	2.362 (3.741)	-4.151* (1.805)	-.030* (.012)	...	.209† (3.144)
5.488* (2.145)	5.157* (2.506)	5.441* (2.384)	-10.371* (4.351)	-4.119* (1.801)	...	-.055* (.022)	.210† (3.169)
2.852* (1.223)	2.326 (1.364)	1.335 (1.334)	1.498 (2.140)	-1.440 (1.015)	-.016* (.006)	...	.153* (2.149)
2.995* (1.241)	2.735 (1.385)	2.889* (1.337)	4.984* (2.434)	-1.201 (.019)	...	-.019 (.010)	.132 (1.805)
2.363 (1.220)	1.971 (1.420)	.220 (1.362)	.734 (2.128)	-2.843† (1.023)	-.022† (.007)	...	.241† (3.772)
2.309 (1.240)	2.618 (1.444)	2.338 (1.374)	5.394* (2.483)	-2.795* (1.041)	...	-.031* (.014)	.217† (3.306)

NOTE. — Standard errors are in parentheses under variables. F -ratios are in parentheses under R^2 .

total of 210 observations. The districts were represented by dummy variables.

Two forms of borrowing were estimated. The first was designed to show the relationship between relative amounts of borrowing and the explanatory variables. This relationship is represented by the ratio of borrowing from the Federal Reserve to demand deposits adjusted (B_f/DD_a) and of borrowings from other sources to demand deposits adjusted (B_o/DD_a). The second form of borrowing was designed to show how the proportion of banks that borrowed in each district was affected by changes in liquidity conditions or interest rate differentials. The proportion of banks borrowing from the Federal Reserve was represented by (B_{ff}) and the proportion borrowing from other sources by (B_{of}).

The amount of borrowing from the Federal Reserve and from other sources is estimated in equations 15 and 16, respectively.

$$(15) \frac{B_f}{DD_a} = .039(P) \dagger - .150(LQ) \dagger \\ (.008) \quad (.019) \\ + 18.86(D_1) \dagger + 25.15(D_5) \dagger \\ (2.120) \quad (2.478) \\ + 30.43(D_8) \dagger + 31.33(D_9) \dagger \\ (2.983) \quad (1.600) \\ + 33.96(D_{11}) \dagger + 11.02(D_{12}) \dagger \\ (3.494) \quad (1.539)$$

$$\bar{R}^2 = .74, F = 79.28$$

$$(16) B_o/DD_a = .019(P_1) * \\ (.009) \\ - .348(LQ) \dagger + 50.312(D_1) \dagger \\ (.023) \quad (2.673) \\ + 55.827(D_5) \dagger + 78.997(D_8) \dagger \\ (3.125) \quad (3.762) \\ + 76.675(D_9) \dagger + 99.761(D_{11}) \dagger \\ (2.018) \quad (4.407) \\ + 37.895(D_{12}) \dagger \\ (1.940)$$

$$\bar{R}^2 = .95, F = 514.876$$

In both equations 15 and 16, borrowing was explained by the interest rate differential, liquidity, and district variables.³

It should be recalled that borrowing in the cross sections was related to Federal Reserve district. The variation in borrowing among districts gave rise to the question of causal factors not explicitly considered in the equations. This problem was handled by demonstrating that borrowing from other sources also varied significantly among districts and the patterns that resulted from ranking the districts in order of their likelihood of borrowing were roughly the same for B_f and B_o . It was concluded, therefore, on the basis of the cross sections, that the variations among districts reflected mainly demand factors.

The relative amounts of borrowing from the Federal Reserve differed among districts in the time series as well as the cross sections. However, when the districts were ranked in order of the amounts borrowed from the Federal Reserve and from other sources, the rankings were found to be precisely the same (Table 5). Once again the differences in borrowing among districts

TABLE 5

DISTRICTS RANKED BY RELATIVE AMOUNTS OF BORROWING FROM THE FEDERAL RESERVE AND FROM OTHER SOURCES

Order	B_f/DD_a	B_o/DD_a
1	D_{12}	D_{12}
2	D_1	D_1
3	D_5	D_5
4	D_8	D_8
5	D_9	D_9
6	D_{11}	D_{11}

NOTE. — Order is from least likely to most likely to borrow.

³ The coefficients of the district variable reflect deviations from the district average. For instance, if this average were 25.0, membership in D_1 would mean a less-than-average level of borrowing from the Federal Reserve in equation 15, given the liquidity condition and rate differential. Similarly, membership in D_{11} would imply a greater-than-average level of borrowing.

would seem to be associated with demand factors.

Equations 17 and 18 are used to estimate the proportion of banks in each district that borrowed from the Federal Reserve (B_{ff}) and other sources (B_{of}), respectively.

$$(17) B_{ff} = - .779(P_1)^\dagger - 1.915(LQ)^\dagger \\ \quad \quad \quad (.115) \quad \quad (.264) \\ \quad \quad \quad + 38.562(D_1) + 541.160(D_5)^\dagger \\ \quad \quad \quad (30.142) \quad \quad (35.231) \\ \quad \quad \quad + 488.728(D_8)^\dagger + 465.152(D_9)^\dagger \\ \quad \quad \quad (42.417) \quad \quad (22.752) \\ \quad \quad \quad + 513.350(D_{11})^\dagger + 280.008(D_{12})^\dagger \\ \quad \quad \quad (49.684) \quad \quad (21.884)$$

$$\bar{R}^2 = .871, F = 181.300$$

$$(18) B_{of} = - .048(P) - 1.746(LQ)^\dagger \\ \quad \quad \quad (.068) \quad \quad (.197) \\ \quad \quad \quad + 568.572(D_1)^\dagger + 714.378(D_5)^\dagger \\ \quad \quad \quad (22.454) \quad \quad (26.246) \\ \quad \quad \quad + 518.473(D_8)^\dagger + 480.353(D_9)^\dagger \\ \quad \quad \quad (31.598) \quad \quad (16.949) \\ \quad \quad \quad + 571.259(D_{11})^\dagger + 590.233(D_{12})^\dagger \\ \quad \quad \quad (37.012) \quad \quad (16.303)$$

$$\bar{R}^2 = .971, F = 961.70$$

Equation 17 demonstrates that a strong relationship existed between the proportion of banks in each district that borrowed from the Federal Reserve and the explanatory variables. The proportion of banks that borrowed from the Federal Reserve varied inversely with the profit spread and liquidity position. This indicates that at least part of the increased amounts of borrowing that took place when the bill rate exceeded the discount rate resulted from an increase in the number of borrowing banks. This finding supports the view that the effects of tight money are passed from one bank to another, affecting greater proportions as alternative sources of liquidity dry up.

As in previous equations, there were differences in borrowing among districts. The

proportion of banks borrowing from the Federal Reserve is roughly the same as the relative amounts borrowed. The rankings by district for relative amounts and proportions are combined in Table 6.

TABLE 6

DISTRICTS RANKED BY RELATIVE AMOUNTS (B_f/DD_a AND B_o/DD_o) AND PROPORTIONS OF BANK BORROWING (B_{ff} AND B_{of})

Order	B_f/DD_a	B_o/DD_o	B_{ff}	B_{of}
1	D_{12}	D_{12}	D_1	D_9
2	D_1	D_1	D_{12}	D_8
3	D_5	D_5	D_9	D_1
4	D_8	D_8	D_8	D_{11}
5	D_9	D_9	D_{11}	D_{12}
6	D_{11}	D_{11}	D_5	D_5

NOTE.—Order is from least to most amount and proportion of borrowing.

Equation 18, which focuses on the proportion of banks borrowing from other sources, is rather difficult to explain. In the first place, the sign of the cost variable P is negative. This suggests that as the cost of discounting becomes greater than the rate on borrowing from other sources, the proportion of banks borrowing from other sources falls. This seems unlikely. The variable P itself, however, was not statistically significant.

As with borrowing from the Federal Reserve, the proportion of banks borrowing from other sources varied noticeably among districts. However, in the former this variation was attributed to demand factors on the basis that the same patterns of borrowing were prevalent for borrowing from the Federal Reserve as for borrowing from other sources. The proportion of banks borrowing from other sources varied among districts, but the rankings were not similar to the rankings of borrowing from the Federal Reserve. The reason for the unusual pattern of borrowing from other sources is not immediately clear. An appropriate explanation would require further investigation.

TOWARD A SEASONAL BORROWING PRIVILEGE: A STUDY OF INTRAYEAR FUND FLOWS AT COMMERCIAL BANKS

Emanuel Melichar

Board of Governors of the Federal Reserve System

Contents

Objectives and Procedures	95
Fund Flows at Individual Banks: Definition	96
Calculation of trend-adjusted intrayear changes	
Special terminology for assets, liabilities, and flows	
Fund Flows at Individual Banks: Two Examples	98
How the examples were chosen	
Computation of trend-adjusted intrayear flows	
Relative changes and flows	
Portfolio adjustments in response to fund flows	
Preliminary lessons from the examples	
Origin of Intrayear Fund Flows	101
Changes in IPC deposits	
Changes in nonfinancial loans	
Independence of loan and deposit changes	
Coincidence of loan and deposit drains	
Fund Outflows: Summary of Aggregate Data	102
Relative Outflows at Individual Banks	103
A Seasonal Borrowing Privilege	104
Design of a seasonal discount program	
Potential borrowings by period and by size of bank	
Potential borrowings under alternative deductible levels	

Preface

When the Federal Reserve System initiated a reappraisal of the discount mechanism, one avenue of investigation was concerned with facilitating the provision of discount credit for seasonal purposes. Such study required evidence on seasonal fund flows at individual commercial banks throughout the Nation. To help meet this need for data, the project reported herein was developed to estimate intrayear flows of funds between call dates on a uniform basis for all banks. These data helped in assessing the need for seasonal discount credit and in designing a mechanism through which such credit could be provided on a routinized basis.

This study, undertaken during 1966–67, measures intrayear fund flows at individual banks and provides estimates of potential borrowings under assumed alternative seasonal discount arrangements. These estimates are based on certain definitions of loan and deposit flows, and flows so defined were calculated solely for standard (calendar) quarterly and semiannual periods. It is unlikely that even these intrayear flows were truly ascertained, as only crude adjustments could be made for trends in loans and deposits.

In contrast, the seasonal borrowing privilege later proposed by the Steering Committee specifies somewhat different definitions of loans and deposits to be used in the calculation of seasonal needs of individual banks, suggests a monthly or 4-week moving-average basis, and presumably utilizes more rigorous methods to separate seasonal from trend, cyclical, and irregular movements in loans and deposits. In formulating its proposal, the Committee was also guided by other studies that tested its effect while using data and methods more closely attuned to its specifications.

Therefore, the reader is warned that the estimates presented herein cannot be interpreted as representing, even roughly, flows and borrowings to be expected under the seasonal borrowing privilege as now proposed. But hopefully, the relationships found in this study continue to be broadly indicative of the need for and design of a seasonal borrowing privilege.

An earlier version of this paper that presents more detailed and disaggregated data is available from the author upon request.

Emanuel Melichar
December 1970

TOWARD A SEASONAL BORROWING PRIVILEGE: A STUDY OF INTRAYEAR FUND FLOWS AT COMMERCIAL BANKS

OBJECTIVES AND PROCEDURES

Among the aspects of discount operations being reviewed during the fundamental re-appraisal of the discount mechanism is the attitude of the Federal Reserve System toward member bank use of the discount window for seasonal needs. Present policy contemplates that each member bank will maintain sufficient liquidity to meet seasonal swings that it might normally expect, with assistance at the window confined to dealing with variations of unusual amplitude. However, because the liquidity of many banks has been reduced since this policy was formulated, it is pertinent to examine whether banks should now be permitted to meet a larger portion of their seasonal needs through discounting.

Basic data required for such study are the flows of funds at individual banks, rather than the published summaries of banking data that reveal only the net flow totals for large groups of banks. The magnitude and duration of individual seasonal flows, as well as their distribution among different types and sizes of banks, could affect the advisability of liberalizing borrowing at the discount window for seasonal purposes. These factors would also be important in formulating rules under which more liberal borrowing might be implemented.

To develop this statistical base for a seasonal borrowing proposal, the following sequence is followed in this paper. First, a specific definition of intrayear fund flows is adopted and the fund flows at individual banks are calculated for selected periods. The flows at individual banks are then summed to show their aggregate origin, direction, and magnitude.

Next, attention is focused on banks at which seasonal flows of funds are large in relation to the size of the banks. Within the considerable limitations imposed by the data used, it is shown that a significant proportion of banks do have large relative seasonal outflows of funds; that these banks tend to be small, presumably with limited access to financial markets that larger banks could use to meet such pressures; and that, because these banks are generally small, their borrowings under a seasonal discount program designed to serve them would be compatible with continuation of a limited over-all role for the discount mechanism. The report concludes with estimates of total borrowings under alternative discount programs that would allow these individual banks to borrow a portion of the funds that they need to meet their typical seasonal outflows.

FUND FLOWS AT INDIVIDUAL BANKS: DEFINITION

Fund flows at each bank were calculated from data obtained on reports of condition (call reports) during two 12-month periods. The year from July 1962 to June 1963 was processed on a quarterly basis and was used because it is the latest period for which spring and autumn call data are available in machine-language form. To provide more recent data as well as a second year for comparison, the period from July 1965 to June 1966 was also processed. These were the latest data available when the analysis was performed.

Reports of condition were available for every member and insured nonmember bank, but the only banks included in the study were those for which comparable reports could be constructed for each call date in the period examined. Thus, banks that had been newly created or liquidated during the period were excluded, but banks involved in a merger were retained by summing their separate reports prior to the merger to create data comparable to that reported by the merged bank on subsequent call dates. In this manner, the study of the 1962-63 period was able to cover 98 per cent of all banks in existence on June 30, 1963. The 1965-66 study covered 99 per cent of the banks in existence on June 30, 1966.

At the time of the study, call report data constituted the only readily available series on assets and liabilities of individual banks of all sizes and in all regions. Such comprehensive coverage was greatly desired, given the purpose of the work. The principal disadvantage of these series, however, was that not enough measurements were provided during the year to ascertain the peaks and troughs of the seasonal swings at each bank

or to measure accurately the duration of the flows. Also, in common with all data covering past bank performances, the call statistics could not provide a measure of the extent to which banks may have curtailed lending seasonally or held back on seasonal loan expansion because of unavailability of funds. Different seasonal loan patterns might emerge at some banks if a seasonal discount program were adopted.

Calculation of trend-adjusted intrayear changes

Because each set of data covered only 12 months, it was impossible to calculate seasonal components of pertinent bank asset and liability items with anywhere near the degree of sophistication commonly employed in seasonal adjustment of economic time series. The trend could be estimated only in a crude fashion, and there was no basis for separation of irregular movements from seasonal changes. In recognition of these large departures from the usual meaning of "seasonal" in economic studies, the term "intrayear" is applied to the trend-adjusted quarterly or semiannual changes computed in this study.

Allowance for trend in a bank asset or liability item was achieved by first calculating the June-to-June change in the item. Then, one-fourth of this value was subtracted from each observed quarterly change in the item, and one-half of the value was subtracted from each observed semiannual change.

To illustrate this procedure, suppose that a bank experienced an increase of \$100 million in deposits between the June 1962 and June 1963 call dates. The quarterly trend is calculated to be one-fourth of this

value, or an increase of \$25 million. Further, suppose that deposits at this bank actually increased by \$10 million between the June 1962 and September 1962 call dates. The trend-adjusted change in deposits during this quarter is therefore a decrease of \$15 million, calculated by subtracting the quarterly trend increase of \$25 million from the observed increase of \$10 million.

Examples for individual banks given in the next section will further demonstrate this statistical adjustment. Then, in the remainder of the paper, all references to changes in bank asset and liability items will be to the trend-adjusted changes. To simplify the exposition, the qualifying term "trend-adjusted" will be omitted in those sections of the paper.

Special terminology for assets, liabilities, and flows

Several bank asset and liability items used in this study represent special combinations or adjustments of call report items. These are defined as follows:

Net deposits are total deposits less cash items in process of collection and unposted debits drawn on the bank.

IPC deposits are demand, time, and savings deposits of individuals, partnerships, and corporations, including time deposits accumulated for payment of personal loans.

Nonfinancial loans are total gross loans less loans to financial institutions and loans for purchasing or carrying securities.

The bulk of the study is concerned with examination of the net result of simultaneous changes in IPC deposits and nonfinan-

cial loans, which is termed the *fund flow*. The study concentrated on changes in these particular assets and liabilities because they were thought to best approximate the seasonal impact originating within the area served by the bank. Also, these items are relatively free of "window dressing" on call dates. The value of the fund flow for any given period was obtained by subtracting the change in nonfinancial loans from the change in IPC deposits, after both had been adjusted for trend. If the result is positive, it is called a *fund inflow*; if negative, a *fund outflow*.

The calculation of fund flows in each period was performed separately for each bank. Aggregate fund flows for groups of banks were later computed by summing the flows at the individual banks. It was therefore possible to compute aggregate *gross outflow* or *gross inflow* by summing individual flows only at banks with outflow or inflow, respectively. The aggregate *net fund flow* for a group of banks was obtained by summing their individual fund flows irrespective of their direction. The result is either a *net outflow* or a *net inflow*, depending on its sign.

To facilitate comparison of fund flows among banks of different size, *relative fund flow* for a given bank in a given period was calculated as the percentage that fund flow in that period was of the trend value of net deposits at the beginning of the period. In some analyses, the relative change in particular bank asset and liability items was also of interest, and in each case it was computed in the same manner.

FUND FLOWS AT INDIVIDUAL BANKS: TWO EXAMPLES

The concept of a fund flow that is the net result of intrayear changes in both deposits and loans is not a common one, and so an examination of how fund flows originated at individual banks may assist the reader in becoming comfortable with these data. The two examples presented here each represent the average experience of three banks that were similar in deposit size and in the direction and magnitude of their fund flows. In addition to showing how changes in deposits and in loans entered into the calculation of fund flow, the examples show how the relative magnitude of the flow is related to intrayear changes in the loan/deposit ratio, and how certain other asset items fluctuated in response to the varying fund inflows and outflows.

How the examples were chosen

These examples are being given prior to the presentation and analysis of data for all banks. But the examples were in reality constructed after the analysis was completed, and therefore could be chosen to illustrate some of the principal findings of the analysis.

One such finding was that while the major part of national intrayear fund flows originates at large banks, the flows at such banks are usually moderate in size when compared to the assets of the banks. To illustrate this typical case, Bank A was constructed by averaging actual data for three fairly large Eastern banks, each of which had total deposits in the neighborhood of \$500 million. The changes in deposits and loans at these banks were representative of the upper range of the moderate changes found at other large banks, and thus provide an example of how the principal (in terms of dollar amount) national flows originated.

A second key finding was that numerous smaller banks, usually serving rural areas, are subject to rather severe intrayear fluctuations in deposits and loans. The dollar amounts involved in these cases are small when compared to total national flows, but large relative to the assets of the smaller banks at which they tend to occur. These cases are illustrated by Bank B, which was constructed by averaging data for three banks in Nebraska, each of which had total deposits of about \$3 million.

Computation of trend-adjusted intrayear flows

The presentation that follows uses data from the 1965–66 period, in which the computations and analyses were made on a semi-annual basis. Data for Bank A and Bank B are shown in adjacent columns to facilitate comparison.

Changes in IPC deposits. Outstanding IPC deposits (in dollars) on each of the three call dates used during 1965–66 were:

Date	Bank A	Bank B
June 30, 1965	488,409,000	2,684,000
December 31, 1965	589,233,000	3,549,000
June 30, 1966	562,361,000	2,952,000

The actual deposit changes during each half-year period were therefore:

Period	Bank A	Bank B
July–December	+100,824,000	+865,000
January–June	– 26,872,000	–597,000

To find the trend-adjusted deposit changes, the first step is to calculate the average semiannual change that is due to the deposit trend experienced at both banks. One-half of the change in deposits between June 1965 and June 1966 is regarded as the change due to trend in each semiannual period, as follows:

Period	Bank A	Bank B
July–December	+36,976,000	+134,000
January–June	+36,976,000	+134,000

The trend-adjusted change in each period is then computed by subtracting the change due to trend from the actual change, which gives the following trend-adjusted deposit changes:

Period	Bank A	Bank B
July–December	+63,848,000	+731,000
January–June	–63,848,000	–731,000

Note that, with only two “seasons,” the trend-adjusted change for one period is necessarily the mirror image of that for the other period, as the sum of the trend-adjusted intrayear changes within any given annual period must be zero.

Changes in nonfinancial loans. Similar computations yield the trend-adjusted changes in nonfinancial loans. The outstanding amounts (in dollars) on the call dates were:

Date	Bank A	Bank B
June 30, 1965	367,640,000	2,414,000
December 31, 1965	409,705,000	1,664,000
June 30, 1966	439,497,000	2,485,000

Thus the actual semiannual changes were:

Period	Bank A	Bank B
July–December	+42,065,000	–750,000
January–June	+29,792,000	+821,000

And the semiannual changes ascribed to trend were:

Period	Bank A	Bank B
July–December	+35,928,500	+35,500
January–June	+35,928,500	+35,500

Therefore, the trend-adjusted changes in nonfinancial loans were as follows:

Period	Bank A	Bank B
July–December	+6,136,500	–785,500
January–June	–6,136,500	+785,500

Fund flows. The fund flow in each semiannual period is obtained by subtracting the trend-adjusted change in nonfinancial loans from the trend-adjusted change in IPC deposits, which yields:

Period	Bank A	Bank B
July–December	+57,711,500	+1,516,500
January–June	–57,711,500	–1,516,500

Relative changes and flows

If the deposit and loan changes at each bank are related to a common base, such as assets or deposits of the bank, their relative contributions to the fund flow become readily apparent. The base employed for all such comparisons in this study is the trend value of total net deposits at the bank at an appropriate date. Expressed as percentages of this deposit figure at each bank, the trend-adjusted changes and the fund flow are shown in Table 1.

TABLE 1
RELATIVE TREND-ADJUSTED CHANGES
AND FUND FLOWS
In per cent

Item	July–December		January–June	
	Bank A	Bank B	Bank A	Bank B
Change in deposits	+10.5	+23.3	–10.5	–23.3
Change in loans	+ 1.0	–25.1	– 1.0	+25.1
Fund flow	+ 9.5	+48.4	– 9.5	–48.4

These relative percentages provide desired comparisons among banks and will be much used in later sections. In this example, semiannual relative fund flow at Bank A, the larger Eastern bank, was 9.5 per cent of net deposits, whereas that at Bank B, the smaller rural bank, amounted to 48.4 per cent of net deposits, or about five times the magnitude at Bank A. At Bank A, the main semiannual swing occurred in deposits. To the extent that loans did change, they rose and fell with deposit volume and thus offset part of the deposit flow. But at Bank B, both deposits and loans exhibited relatively large semiannual swings. Furthermore, they moved in opposite directions—loan volume fell while deposits increased, and rose while deposits decreased—and thus accentuated the intrayear fund flow with which management had to cope.

The intrayear fund flow at each bank obviously caused seasonal movements in loan/deposit ratios, and it is interesting to compare the changes in this familiar statis-

tic—(net loans)/(net deposits), expressed as a percentage:

Date	Bank A	Bank B
June 30, 1965	75.8	77.8
December 31, 1965	72.7	40.4
June 30, 1966	77.6	74.9

The severe intrayear fund flow at Bank B, and the correspondingly sharp seasonal swing in its liquidity position, reflected the seasonal demands of the agricultural economy on which this bank was largely dependent. More than three-fourths of its loan volume was in loans to farmers, both in December and at the June peaks. To meet crop production expenses in the spring, farmer-customers of this bank drew down their deposits and also secured additional loans. The significant event from the bank's standpoint, however, was that these funds did not remain with its other customers. Apparently the funds were not spent locally, or they tended to flow out of the community after being spent. (Two of the three banks averaged to form Bank B were in one-bank towns; the third was in a two-bank town.)

The high degree of association with agriculture at Bank B was not unique, as 22 per cent of the Nation's banks had more than half of their loan volume in loans to farmers on June 30, 1966.

Portfolio adjustments in response to fund flows

When a bank experiences a fund inflow or outflow as defined here, other asset or liability items must together show a net change that exactly compensates for the fund flow. As one part of this study, a look is taken at changes in two asset groups—balances on deposit at other domestic banks and holdings of U.S. Government securities—in which banks are generally able and likely to make discretionary changes in direct response to fund inflow or outflow.

Trend-adjusted semiannual changes in these items were computed in the same manner as previously illustrated for deposits and loans. Then, to facilitate comparison of these figures with the fund flow or with other changes at the bank, and to permit direct interbank comparisons, the relative trend-adjusted changes in these items are also shown in Table 2 as percentages of the December trend value of net deposits.

TABLE 2

INTRAYEAR CHANGES IN TWO ASSET GROUPS
In dollars unless otherwise indicated

Asset group	July–December		January–June	
	Bank A	Bank B	Bank A	Bank B
Balances with other banks:				
Actual	+ 7,800,000	+ 231,000	– 6,061,000	– 156,000
Trend-adjusted...	+ 6,930,500	+ 194,500	– 6,930,500	– 194,500
Relative (per cent)	+1.1	+6.2	–1.1	–6.2
U.S. Govt. securities:				
Actual	+14,141,000	+1,160,000	–14,237,000	–1,236,000
Trend-adjusted...	+14,189,000	+1,198,000	–14,189,000	–1,198,000
Relative (per cent)	+2.3	+38.2	–2.3	–38.2

At both banks, semiannual changes in each of these components were in the direction expected as a consequence of the fund flows. At Bank A, the two items together accounted for the use of 36 per cent of the semiannual fund inflow (or conversely, supplied the same proportion of funds to meet the outflow). At Bank B, the major part of the adjustment to the severe fund flow appeared to occur in these two items, particularly in the holdings of U.S. Government securities.

Preliminary lessons from the examples

The contrast between fund flows at the two composite “banks” is typical. The generalization of these differences is the purpose of this study and is thought to have major implications for seasonal discount policies of the Federal Reserve System.

At the larger and primarily urban bank,

the fund flow arose mainly through changes in deposits. Deposits increased during the second half of the year and fell during the first half, whereas loan volume displayed little change. But at the smaller rural bank, loan volume underwent a substantial change because of very high dependence of the bank and the community on a single industry that had a marked seasonal need for funds. For the same reason, deposits at the smaller bank also exhibited a greater relative intrayear change.

Relative to its deposits, the larger bank found that small changes in U.S. Government securities and in balances with other banks sufficed to cope with its fund flow. In contrast, the smaller bank had to make relatively large changes in these items, and on a relative basis its portfolio adjustment

problem loomed much larger than that of the bigger bank. During part of the year, relatively large amounts had to be kept idle or invested in securities that could be readily liquidated to meet the coming seasonal outflow of funds.

At the larger bank, the dollar amount of the semiannual fund flow was much greater than at the small bank—\$57.7 million compared to \$1.5 million. However, the magnitude relative to the size of the bank—the importance of the intrayear fluctuation to banking operations—was much smaller at the large bank—9.5 per cent of net deposits, compared to 48.4 per cent at the small bank. Thus by providing a relatively small amount of funds, the Federal Reserve could materially assist the small bank in meeting its relatively large seasonal pressures.

ORIGIN OF INTRAYEAR FUND FLOWS

As defined for this study, fund outflows and inflows in a given quarter or half-year period can originate through various combinations of trend-adjusted changes in IPC deposits and in nonfinancial loans. (In the remainder of this paper, all intrayear data cited are trend adjusted.) These changes are examined on a semiannual basis during 1965–66 and on a quarterly basis during 1962–63, the latest period for which quarterly flows could be calculated. (An examination of semiannual flows during 1962–63 showed marked resemblance to those of 1965–66.)

Changes in IPC deposits

The most prevalent influence on flows was a tendency for deposits to increase during the second half of the year and to decrease during the first half. In 1965–66, 81 per cent of member banks experienced this movement.

Deposits rose at 64 per cent of the member banks during the third quarter of 1962 and at 70 per cent over the fourth quarter. They then decreased at 75 per cent of member banks in the first quarter of 1963 and at 60 per cent during the second quarter of that year.

Changes in nonfinancial loans

At many banks, loan volume tended to increase in the spring and decrease in the fall. For instance, loans fell at 57 per cent of the member banks during the second half of 1965 and rose from January through June of 1966. Loans decreased at 65 per cent of the member banks in the third quarter of 1962 and at 49 and 62 per cent in the fourth quarter of 1962 and first quarter of 1963, respectively. But on the other hand, the volume of loans rose at 73 per cent of the member banks during the second quarter of 1963.

Independence of loan and deposit changes

During each period, the direction of the change in loans at an individual bank appeared largely independent of the direction of the change in deposits. For instance, the proportion of member banks at which loans decreased during a given period was about the same in the group in which deposits were up as in the group in which deposits were down. Among the member banks at which deposits decreased from July to December 1965, for example, loans fell at 58 per cent and rose at 42 per cent. Among the member banks at which deposits increased, loans fell at 57 per cent and rose at 43 per cent. Similar independence between loan and deposit changes was observed in all periods studied.

Coincidence of loan and deposit drains

However, such independence of loan and deposit changes did not preclude loan and deposit drains from coinciding at a large proportion of banks during the spring season. Thus, in the first half of 1966 nearly one-half of member banks experienced a reduction in deposits combined with an increase in loans, resulting in an outflow of \$5.5 billion. Another one-third experienced a reduction in both deposits and loans, but the generally greater deposit changes resulted in a net fund outflow of \$3.2 billion.

The first quarter of 1963 was charac-

terized by deposit reductions, which occurred at three-fourths of the member banks. Loan volume also went down at more than half of these banks, but the total of the deposit changes was much larger and resulted in a net fund outflow of \$3.3 billion. Additional fund outflow of \$2.1 billion occurred at banks that experienced a rise in loan volume while their deposits decreased; such banks constituted 27 per cent of all member banks. Only one-fourth of member banks had deposit gains, for net fund inflow of just \$0.7 billion. Net outflow therefore totaled \$4.6 billion at all member banks, the largest quarterly net outflow of the year.

The deposits-down, loans-up squeeze was most common during the second quarter, when 42 per cent of member banks experienced a drop in deposits while loan volume rose. Fund outflow arising from this squeeze totaled \$2.7 billion. At another 18 per cent of the banks, at which both loan and deposit volumes were reduced, there was an additional \$0.6 billion of net fund outflow. Offsetting net fund inflow of \$0.8 billion occurred at the 40 per cent of banks at which deposits rose during this quarter. Total net fund outflow at all member banks was therefore \$2.5 billion, or only slightly more than one-half of the net outflow of the first quarter. As noted, however, more banks experienced the deposits-down, loans-up squeeze than in the first quarter.

FUND OUTFLOWS: SUMMARY OF AGGREGATE DATA

In this section the primary focus settles on banks with fund outflow during a given period, in the belief that these banks constitute the prime candidates for use of seasonal discount credit during that period.

In examining fund outflow at a given group of banks, two statistics seem very relevant: the proportion of banks that ex-

perienced outflow, and the dollar amount of that outflow.

On the semiannual basis, 22 per cent of member banks had outflow during the second half of 1965. This outflow totaled \$0.9 billion and amounted to 1.7 per cent of net deposits at these banks.

In the first half of 1966, 78 per cent of

member banks had outflow that totaled \$9.1 billion and amounted to 4.7 per cent of net deposits at such banks.

Semiannual data for 1962-63 exhibited approximately the same relationships. Quarterly member bank data for this period were as shown in the accompanying table. At the banks with outflow, the amount ranged from 2.2 per cent of their net deposits in the third quarter to 3.8 per cent in the first quarter.

The proportion of all member and insured nonmember banks with outflow in each period was virtually identical to the proportion of member banks alone. But in

Quarter	Percentage of banks with outflow	Outflow (billions of dollars)
3	31	2.1
4	37	.9
1	68	5.7
2	69	4.1

each period the outflow at those nonmember banks with outflow was greater relative to their net deposits.

In the remainder of this report, data will be limited to member banks. These banks constitute the group that would be immediately eligible to take advantage of discount regulations designed to provide more seasonal credit.

RELATIVE OUTFLOWS AT INDIVIDUAL BANKS

The relative size of the fund outflow for a given period at each bank was measured by comparing the outflow to the trend value of total net deposits at the start of the period, as described and illustrated earlier. These percentages provide a basis for comparing outflows among banks of different size that more nearly reflects the magnitude of the portfolio adjustment and other problems posed by the outflow than does the dollar amount of the outflow.

In each period studied, outflows at most banks were limited to less than 10 per cent of deposits. In fact, during each semiannual period, about one-half of the banks with outflow experienced outflows amounting to less than 5 per cent of their net deposits, and during each quarter over three-fifths of the banks with outflow were within this figure. The bulk of the total outflow occurred at these banks with small or moderate individual outflows. But in each period some banks had relatively large outflow.

There were few large outflows on a relative basis during the second half of both 1965 and 1962, and the total outflow at these banks was small (Table 3).

TABLE 3
FUND OUTFLOWS AT INDIVIDUAL BANKS

Relative outflow (percentage of net deposits)	Percentage of all member banks with specified outflow	Total outflow (billions of dollars)
July-December 1965	22	.9
Under 5.0	17	.6
5.0-9.9	4	.2
10.0 and over	2	.1
July-December 1962	22	.6
Under 5.0	17	.4
5.0-9.9	3	.1
10.0 and over	1	.1
January-June 1966	78	9.1
Under 5.0	39	3.8
5.0-9.9	25	3.9
10.0 and over	14	1.5
January-June 1963	78	7.7
Under 5.0	37	2.6
5.0-9.9	25	3.6
10.0 and over	16	1.6

Data for the fourth quarter of 1962, however, reveal a greater frequency of the larger relative outflows—a finding that is submerged in the semiannual data because these banks had either fund inflow or only small fund outflow during the third quarter. During the fourth quarter, in which the banking system as a whole was experiencing its greatest net fund inflow, 12 per cent of member banks had outflows amounting to at least 5 per cent of their deposits, and at 4 per cent of banks the outflow equaled 10 per cent or more of deposits.

Large relative outflows were common in the first half of both 1966 and 1963. About one in every seven member banks experienced outflow equal to at least 10 per cent of its net deposits, and at some banks the ratio of outflow to deposits was considerably above this level (Table 3). However, the banks with large relative outflows were evidently the smaller banks. For instance, in 1966 the 14 per cent of banks at which outflow was at least one-tenth of deposits

accounted for only 16 per cent of the total outflow of \$9.1 billion.

About two-thirds of member banks had outflows in each of the quarters in the first half of 1963. In each quarter, one-fourth of the member banks had outflow that equaled or exceeded 5 per cent of their deposits. About 8 per cent of the banks had outflows exceeding one-tenth of deposits, and these banks accounted for only a minor proportion of the total quarterly outflows.

A SEASONAL BORROWING PRIVILEGE

Design of a seasonal discount program

It has been shown that only a minor part of total fund outflow occurs at banks with large relative outflow. Data presented in this section further indicate that large relative outflows occur much more frequently among small banks than among the larger institutions. Considered jointly, these findings have several implications for the design of a discount program that would permit more seasonal borrowing by member banks.

To serve only banks with large relative outflows. First, if the seasonal discount program were limited to banks with the larger relative outflows, a significant number of small banks would be assisted in making portfolio adjustments but the total amount of funds supplied would constitute a small proportion of total reserves in the banking system. Second, the small banks that would comprise the majority of banks eligible for the program are likely to be operating at a disadvantage in the present financial markets that are commonly employed for portfolio adjustment purposes. The discount route for seasonal funds should therefore be a relatively attractive one for such banks. Third, many of the small banks with large relative seasonal flows are probably involved

heavily in financing agriculture, a sector that in recent decades has been generating credit demands in excess of its contribution to the growth of rural banking resources. The seasonal discount program would therefore provide a net addition to the lending resources of such banks that currently find it difficult to meet the aggregate local demands for farm credit.

To require banks to fund part of outflow. An additional practical consideration enters into the design of a discount program to serve banks with large relative seasonal fund flows. Only that part of the seasonal outflow exceeding a specified relative level ought to be funded through discounting; otherwise, banks would unwisely be given an incentive to achieve seasonal outflows. But if each bank were required to meet, through portfolio adjustment, all seasonal outflow up to a specified proportion of its resources, the incentive to undertake operations that deliberately create or accentuate seasonal flows would be largely removed. At the same time, a bank experiencing large relative seasonal credit demands that it believes should be met would be encouraged to do so, and by discounting would be able to obtain funds for this purpose to meet

demands that it might otherwise be unable to fulfill.

The level of the "deductible" quantity—the amount of its seasonal outflow that a bank would be required to meet from sources other than borrowing at the discount window—could be set at a given percentage of average deposits. The level at which this percentage is set affects both total potential borrowings and the distribution of the potential borrowings among large and small banks. As the level is lowered, more of the larger banks that experience moderate intrayear outflows qualify for seasonal borrowing, and potential total borrowings increase rapidly. As the deductible is raised, potential total borrowings diminish, but so does the value of the program to those banks with large relative outflows.

On the basis of the intrayear outflow data that have been presented, deductible levels of 5 and 10 per cent of net deposits may represent approximate lower and upper limits, respectively, of the deductible for a seasonal borrowing program that might provide significant assistance to many banks, yet keep potential borrowings within the scope permitted to the discount mechanism in recent years. Under the 5 per cent deductible, potential borrowings in the spring are estimated at \$2 billion, with just over one-half of the sum going to banks with deposits of \$100 million and over. Potential springtime borrowings under the 10 per cent deductible plan are estimated at \$400 million, with perhaps two-fifths of the total being borrowed by the large banks.

As a representation of real potential borrowings, these estimates are subject to the same basic weakness as the fund outflows considered throughout the study—the inherent disadvantage of being based on quarterly or semiannual observations that are unlikely to have measured the true seasonal

peaks and troughs, and the likelihood that with discounting providing a source of additional seasonal funds, some banks would make additional seasonal loans that they were unable to make during the past periods that have been examined.

Potential borrowings by period and by size of bank

In both 1965 and 1962, relatively few member banks had large or even moderate relative outflows in the second half as a whole. The amounts exceeding the deductible were small even under the 5 per cent rule (Table 4). Most of the seasonal borrowing that might occur in this period would evidently be at small banks. This would be particularly true in the fourth quarter of the year, in which a fair proportion of small banks, but no large banks, had large relative outflow. On a quarterly basis, potential borrowing demands appear larger in the fourth quarter than in the second half as a whole but are still relatively small sums.

TABLE 4
POTENTIAL BORROWINGS BY SIZE OF BANK

Net deposits at bank (millions of dollars)	Percentage of specified banks with outflow over—		Total outflow (millions of dollars) over—	
	5% of deposits	10% of deposits	5% of deposits	10% of deposits
July–December 1965 ..	5	2	140	54
Under 10	7	2	48	19
10–99	3	1	75	36
100 and over	1	...	17	...
July–December 1962 ..	5	1	91	25
Under 10	6	2	37	15
10–99	3	1	43	11
100 and over	1	...	11	...
January–June 1966 ...	39	14	1,989	409
Under 10	43	19	385	150
10–99	34	7	565	100
100 and over	32	5	1,039	159
January–June 1963 ...	41	16	2,087	441
Under 10	44	20	420	184
10–99	35	8	514	114
100 and over	36	6	1,153	144

Major borrowing under a seasonal discount program would evidently occur in the first half of the year. A rather large proportion of small member banks—about one-fifth of those with deposits under \$10

million—might be eligible for borrowing even under the 10 per cent deductible plan. Some large banks also would be eligible and would account for a significant portion of the total potential borrowings, on the basis of data for 1966 and 1963 (Table 4). At \$2 billion, total potential borrowings under the 5 per cent deductible were almost five times the potential borrowings under the 10 per cent plan. The proportion of potential borrowings at large banks was larger under the 5 per cent deductible.

On a quarterly basis, potential borrowings appeared lower than those just shown for the first half as a whole because many banks had outflow in both quarters of the period. The cumulative data covering both quarters may therefore be more indicative of the level that potential borrowings could reach in this peak outflow period.

Potential borrowings under alternative deductible levels

There are large differences in banks eligible and in potential borrowings under the 5 per cent and 10 per cent deductible levels.

The 10 per cent level appears rather restrictive, unless it is found that many banks have in fact been forced to limit seasonal lending significantly in recent years. But the 5 per cent deductible, under which two-fifths of member banks might be eligible, perhaps violates the intent to limit the program to banks with relative outflows significantly above average. Under other alternative deductible levels within this range, using data for 1965–66, potential borrowing is as shown in Table 5.

TABLE 5
POTENTIAL BORROWINGS BY DEDUCTIBLE LEVELS

Outflow during period exceeds net deposits by at least—	Percentage of member banks with specified outflow	Total outflow (millions of dollars) exceeding specified percentage of net deposits
July–December 1965:		
5 per cent	5	140
6	4	113
7	3	90
8	3	75
9	2	63
10	2	54
January–June 1966:		
5 per cent	39	1,989
6	32	1,422
7	26	1,022
8	22	724
9	17	531
10	14	409

CAPITAL AND CREDIT REQUIREMENTS OF AGRICULTURE, AND PROPOSALS TO INCREASE AVAILABILITY OF BANK CREDIT

Emanuel Melichar, Board of Governors of the Federal Reserve System

Raymond J. Doll, Federal Reserve Bank of Kansas City

Contents

I. Introduction	109
II. Summary of Findings and Proposals	109
Part 1. CAPITAL AND CREDIT REQUIREMENTS OF AGRICULTURE	114
III. Capital Requirements, 1950–79	115
Capital stock of agriculture, 1950–80	
Capital requirements by asset group, 1950–79	
Total capital flows, 1950–79	
IV. Credit Requirements, 1950–79	129
How have capital requirements been financed?	
Projected credit requirements, 1970–79	
V. Sources of Credit, 1950–79	136
Sources of outstanding credit, 1950–68	
Relative role of banks, 1950–68	
Projected credit expansion by major lenders, 1970–79	
Supply of funds at rural banks	
VI. Seasonal Production Credit	145
Seasonal capital requirements	
Seasonal credit extensions	
Institutional sources of seasonal credit	
Part 2. PROPOSALS TO INCREASE AVAILABILITY OF BANK CREDIT	150
VII. Correspondent and Branch Banking	151
Correspondent banking	
Branch banking	
VIII. Federal Reserve Credit	159
Seasonal discount credit	
Longer-term credit	
IX. Unified Markets to Serve Rural Banks	167
Organization	
A secondary market for rural bank loans	
Other services of unified markets	
X. Concluding Comments	172

CAPITAL AND CREDIT REQUIREMENTS OF AGRICULTURE, AND PROPOSALS TO INCREASE AVAILABILITY OF BANK CREDIT

I. INTRODUCTION

A large proportion of the Nation's banks are located in rural areas where agriculture is the primary economic base. Deposit trends at these banks—and loan demands made on them—derive mainly from developments in the agricultural economy. Thus, many aspects of the well-known “revolution” in the structure of agricultural production and related rural business have had major impact on rural banks and promise to continue to exert similar influence for some time. This study gives special attention to those problems of rural banks that arise from the peculiar nature of and changes in their agricultural environment. It seeks to determine how the Federal Reserve discount mechanism might be made more helpful to those banks.

The examination of past and projected agricultural and rural banking trends, however, suggested that maintenance of the present leading role of banks in rural lending will likely require institutional changes beyond those that appear feasible in discount administration and other Federal Reserve policies. Thus after documenting the growing capital requirements of the agricultural sector and the increasing inability of rural banks to finance their usual share of the resulting credit demands, this report outlines a broad program designed to increase materially the flow of funds from national capital and money markets into rural areas through the banking system.

This paper was first prepared in 1966, and was expanded and updated in October 1969.

II. SUMMARY OF FINDINGS AND PROPOSALS

Capital used in agriculture has been increasing rapidly. Since 1950, for example, the value of farm assets of a primarily productive nature has risen by 131 per cent. This growth is traced mainly to technological developments that have prompted enlargement of individual farms and substitution of purchased inputs for labor and farm-produced inputs. Some of the capital growth occurred as farmers added to physical stocks of machinery, livestock, and other assets. Another part can be ascribed to growth and price inflation in the nonfarm

economy, which brought higher prices for some purchased inputs and added to demand for land. And a substantial portion resulted from land price increases to which farm enlargement, land improvement programs, and other technologically induced pressures contributed. In addition, as agriculture purchased more production inputs, capital requirements of related rural businesses also rose.

Several agricultural economists have recently studied farm capital growth. Each concluded that the value of capital stocks

will rise further, though they differed on the rate of growth and on which assets will lead the advance. By using information mainly from these studies, three alternative capital models are developed in this study. In the lowest of these estimates, the value of farm assets projected for 1980 is 28 per cent above that of 1969, whereas the highest estimate indicates a gain of 74 per cent.

From the projected capital stocks, estimates are made of the implied yearly capital flows—the capital requirements that must be financed in some manner. As the capital assets of agriculture increase, larger annual flows of capital are generally required to make real additions to stocks, replace equipment as it depreciates, and transfer assets from one farmer to the next. Annual capital flows for these purposes are estimated to have averaged \$7 billion during the 1950's and to have been fairly stable during the late 1950's and early 1960's. By 1965–68, however, the annual flow averaged \$11 billion per year. And under the three alternative capital models formulated herein, capital flows are projected at from \$13 to \$19 billion in 1975–79.

Annual capital flows are financed either internally from cash flow—depreciation allowances and net income—or externally by expanded use of credit. Upon comparing estimated capital flows, known expansion of credit, and estimated cash flows, it appears that the proportion of cash flow allocated by farmers to capital needs declined during the 1950's. Consequently, the share of capital spending financed by debt rose from 13 per cent in the early 1950's to 31 per cent in the early 1960's. Then, the proportion of income allocated to capital apparently stabilized, but because capital spending rose more sharply than income, the share financed by debt reached 37 per cent during 1965–68.

These findings provide a framework within which future farm credit demands may be projected. For the estimates made herein, capital flow requirements and depreciation allowances were taken as projected by the three alternative capital models, net farm and nonfarm income was projected on the basis of recent trends, and the proportion of cash flow that farmers would allocate to capital spending was projected at the level that prevailed in the 1960's. Outstanding farm debt, which rose from \$10.7 billion in 1950 to \$23.6 billion in 1960 and \$52.0 billion in 1969, in the lowest projection increases to \$91 billion by 1980 and in the highest to \$137 billion. The lowest projection implies that debt will increase by about 5 per cent annually, a significant slowdown from recent growth rates averaging 9 per cent, but a rate that nevertheless calls for \$3 to \$4 billion of net additions to outstanding debt annually between now and 1980. The highest projection calls for debt to rise by \$79 billion during the next decade, which would require annual rates of increase similar to those of the 1960's.

Increased credit to agriculture has been supplied in three important ways. First, more sellers of farms have been taking mortgages or using land contracts. Individuals have been providing about one-fifth of the additions to outstanding farm debt. Second, money and capital market funds have been channeled into agriculture through the lending operations of life insurance companies, Federal land banks, production credit associations, and national farm supply corporations. Such funds have provided about one-half of the growth in farm credit. Third, commercial banks have been supplying about one-fourth of the additional credit. Some of these loans have been made by large money market banks, either directly

or through correspondent relationships with rural banks; much of the loan expansion, however, has occurred at smaller country banks.

Rural banks have increased loans at a much faster pace than their deposits have grown, a divergence made possible by the low ratio of loans to deposits found at most banks when World War II ended. Through lending supported by the past accumulation of deposits, bank credit to farmers has almost kept pace with the total expansion of farm credit, even though deposits, being dependent on gains in aggregate farm incomes and savings, rose at a much slower rate.

However, expansion of bank lending by a relative shift from security investments to loans obviously could not be sustained forever. Individual rural banks began to reach a "tight" position during the 1950's, and a large proportion have now reached the point at which further reductions in liquidity do not appear feasible, given present institutional arrangements. As these banks include most of the larger institutions and those that have been most active in meeting the credit demands of their areas, much of the Nation's farm loan volume is affected.

In the last few years, loan demands would have pressed harder against rural banking resources had not time deposits grown at an extremely rapid pace. Unfortunately, a lower rate of deposit expansion may realistically be expected over the next decade. When the three alternative farm credit demand projections are compared with projected deposit expansion, two indicate that banks as a whole will find it difficult to supply from their own resources the same share of farm credit growth that they have provided since 1950. If rural banks are to maintain their relative role in farm lending, this analysis indicates that they must draw

increasing proportions of their loan funds from sources other than local deposits.

Several existing arrangements permit fund flows between urban and rural areas via banks. In unit-banking States, city bank participations in farm loans channel urban funds into farm lending. A thorough examination of this mechanism, however, leads to serious doubts that it can develop sufficiently to fill the credit gap. Its present use is largely restricted to dealing with overlines rather than with general credit deficits at country banks; in fact, since the usual "payment" for the service consists of deposits maintained at the urban correspondent, the net flow of funds in most cases appears to be to the city rather than the rural bank. For those rural banks that are short of loanable funds, correspondent credit would be more helpful if it could be paid for by fees rather than balances, and development of this practice is advised. However, the generally tight liquidity positions of city banks will hardly lead them to favor this change or to increase significantly the supply of correspondent credit if it were adopted.

In States with large branch-banking systems, funds can flow internally from urban offices to rural branches where loan demand exceeds deposit inflow. Studies of branch systems show that such flows do occur, and that at particular branches the funds so obtained are often relatively greater than a unit bank would have been likely to obtain through the correspondent-banking system. Thus, in States that have well-developed statewide branch systems and also urban areas sufficiently large either to provide surplus funds or to support a bank large enough to tap national money markets, the supply of bank funds to farm lending appears more likely to remain adequate provided that the managers of the branch sys-

tems maintain both interest and competence in farm lending. But even if the latter condition were met, it seems doubtful that expansion of branch banking to rural areas of present unit-banking States will provide an adequate near-term solution to maintenance of banking's role in farm lending. If laws restricting branching are liberalized at all, initial changes are likely to permit only limited branching arrangements. Furthermore, in some rural States with limited urban development, even statewide branch banking might not have a sufficient urban base to increase materially the flow of funds into the rural areas.

New approaches are therefore recommended. To maintain farm lending operations of commercial banks in a fully viable condition—in fact, to improve them at banks that are already experiencing the difficulties cited—two broad proposals for channeling funds to rural banks are made herein. First, greater amounts of Reserve Bank credit should be provided directly to rural banks through changes in the nature and administration of the discount mechanism. Second, new institutional arrangements should be established to permit greatly increased rural bank participation in national capital and money markets.

Small rural member banks have made limited use of System discount facilities in recent decades. The discount window may have been avoided partly because of the manner in which it was administered—the “reluctance to borrow” may have developed into a considerably larger deterrent against borrowing by the smaller banks. In addition, temporary fund needs at rural banks are usually for relatively lengthy periods such as a crop production season, and borrowing arrangements at most Reserve Banks have been ill-adapted to handling such needs. In fact, a strict interpre-

tation of the regulation held that borrowing for normally expected seasonal outflows of funds was inappropriate.

Thus, administration of the discount window that removes any previous stigma associated with borrowings for small short-term adjustments, and that permits borrowing for lengthy seasonal periods under equally clear guidelines, should encourage use of the discount window by rural banks. Seasonal borrowing privileges, in particular, would benefit the significant number of small rural banks and the communities they serve, because farm customers have a large relative seasonal fund demand. By borrowing from the Federal Reserve to meet such seasonal outflows, these banks could employ for other community loan needs the funds that now must be set aside for the seasonal demands and that therefore either remain idle, or are temporarily invested outside the community, for up to half the year.

A seasonal borrowing privilege appears able to provide prompt and significant assistance to rural member banks facing relatively large seasonal demands, but could not be employed by the many rural non-member banks and would likely be relatively insignificant to rural member banks in areas of balanced crop and livestock production, in which farm credit demands occur throughout the year rather than seasonally. A complementary and more general approach—one that would benefit all rural banks—would aim to reduce the capital market imperfections that now largely prevent small and rural banks from using these national markets as a source of funds.

To this end, a second set of proposals is set forth under “Unified markets to serve rural banks.” These markets would be designed to place small and rural banks on a more nearly equal competitive footing with other participants in the national capital and

money markets by minimizing the disadvantages that result from the small size and isolated location of these banks. The major objective of unified markets is seen as facilitating sale of a wide variety of bank assets and liabilities, thereby encouraging national money market funds to flow into rural areas through the banking system much as they presently can through the cooperative credit system. Unified markets could provide rural banks with information and arrangements

for effective trading in Federal funds, Government securities, and certificates of deposit issued by these banks, in addition to a secondary market for loans. In each of these endeavors, they would strive to overcome the market imperfections that now place small and rural banks at a relative disadvantage, and would thereby secure more equitable allocation of money market funds among sectors of the economy and regions of the Nation.

Part 1. CAPITAL AND CREDIT REQUIREMENTS OF AGRICULTURE

Farmers' use of credit increased almost five times in the aggregate and nine times on a per-farm basis between January 1, 1950, and January 1, 1969. Total debt (exclusive of Commodity Credit Corporation debt) rose from \$11 billion to \$52 billion; debt per farm increased from \$1,900 to \$17,000. Several factors combined to bring about this large expansion: new technology spurred upward trends in total farm capital stocks and production expenses; technology also permitted enlargement of individual farms, with associated capital demands; prices of some capital goods—particularly real estate and machinery—advanced considerably; and finally, farmers financed an increasing proportion of their capital requirements by borrowing. Farm debt as a percentage of selected production assets rose from 8.8 per cent in 1950 to 18.5 per cent in 1969.

Since the major forces responsible for the rapid growth of farm debt from its low point of 1946 continue to prevail, there is widespread expectation of further credit expansion. Few studies, however, have attempted to quantify these expectations in a reasonably rigorous and comprehensive fashion. One study that did cover all farm debt was generally assumed to have reached a bullish—perhaps even alarming—conclusion by projecting outstanding farm debt of \$100 billion in 1980. In fact, however,

this projection implied a substantial slowdown in the rate of credit expansion, which followed as a consequence of the much reduced rates of future capital spending and land price inflation that were assumed in the study. Other analyses of investment and land prices appear to support much higher expectations, but their authors stopped at projecting the value of capital stocks rather than also examining the implied capital flows and credit demands.

This paper therefore attempts first to ascertain and analyze postwar capital flows in agriculture and then to remedy the paucity of projections of such flows. In Section III, the nature and magnitude of past and future capital requirements are explored. Uses of capital are identified, and the flow of capital into each use is estimated. Projections of capital flows for 1970–79 are then derived for each of three projections of farm capital stocks in 1980 that have been published in studies by other analysts.

Section IV then attempts to determine likely future credit demands, given the projected capital flows. To provide a basis for such credit projections, financial data for 1950–68 are examined to ascertain trends in the manner that capital flows required in this period were financed—whether internally from depreciation allowances and net income or externally through increase in

debt. Then, with the aid of specific assumptions about future income and financial behavior of farmers, probable additions to debt are projected. (With additional time and resources, development of a model in which capital, income, and savings flows are jointly determined would be a preferable procedure, and perhaps will be inspired by these preliminary efforts.)

After projection of total credit demands, attention turns to the various lenders that may supply these funds. Again, although apprehensions have often been expressed about the continued ability of certain farm lenders—particularly commercial banks—to continue rapid expansion of farm credit, no previous study has pitted specific alternative projections of credit demands against projections of bank lending resources, in order to determine the situations in which those fears might be justified. This analysis is attempted in Section V. First, sources of additions to farm debt during 1950–68 are examined in order to ascertain the share of credit provided by each lender group. Then,

for each of the alternative credit projections derived in the preceding section, estimates are made of the amount by which banks would have to expand their farm lending in order to maintain their relative role in this market. The various required rates of expansion in loans are compared with the projected rate of growth in deposits, to determine the conditions under which banks are likely to experience future difficulty in meeting farm loan demands from their own resources.

Credit extensions to meet seasonal capital requirements are treated separately in Section VI. Because neither seasonal expenses nor total seasonal loans are measured directly, little quantitative analysis of these flows has been attempted at the national level. However, in Section VI an attempt is made to provide indicators of the trend in seasonal capital needs and in seasonal credit provided by banks and production credit associations. The relative extent to which these two lenders have met the increased seasonal needs is then estimated.

III. CAPITAL REQUIREMENTS, 1950-79

Measurement, analysis, and projection of capital used in agriculture have primarily dealt with stocks of assets and with past and expected changes in those stocks. The U.S. Department of Agriculture annually publishes the value of several categories of farm assets such as real estate, machinery, and livestock. Analytical studies have related observed changes in these series to changes in various farm and nonfarm factors. On the basis of these observed relationships, together with estimates of future trends in the causal factors, several recent studies have projected values of major farm assets to 1980.

This section begins with a brief review

of past developments and of three selected projections of capital stocks. These data alone, however, prove inadequate as indicators of the actual flow of capital into agriculture, both past and future. The annual capital flows, although related, are not equivalent to changes in the value of stocks. In particular, large amounts of capital are required annually to replace machinery that has worn out or become obsolete and to finance transfers of real estate. Thus, in a given year the value of stocks could remain unchanged because of stable prices and no net real investment, but several billion dollars of capital would be required by replacement and transfer transactions. Conversely,

although price increases of machinery or land that cause assets to be revalued upward would have the same proportional effect on replacement and transfer transactions, the dollar increase in the latter would be only a small fraction of that in stocks, because only a portion of the stocks is replaced or transferred in any given year.

A significant analytical contribution of this section, therefore, is calculation of past annual capital flows and of flows implied by the stocks projected for 1980. Data on most kinds of capital spending were available from the USDA, but one very important category—real estate transfers prior to 1965—had to be estimated. Capital spending and transfers implied by each projection of stocks were also estimated, with attention to whether an increase in stocks was expected to result from price rises or from real additions. Each type of asset is discussed separately, to consider the factors that probably caused past changes in the annual capital flow that it required and hopefully to establish a basis for projection of probable future change. The projected components are then summed to obtain three alternative projections of farm capital flows during the 1970's.

Capital stock of agriculture, 1950–80

The stock of various types of farm capital, valued at current market prices, is estimated annually by the USDA. Table 1 shows

that selected assets of a primarily productive nature totaled \$281.1 billion as of January 1, 1969. These assets—machinery, livestock, stored crops, working capital, and real estate—constitute the capital analyzed in this study. The account includes some nonproductive assets such as dwellings, personal cars, and some forms of personal savings. It excludes the two other personal assets included in the USDA's *Balance Sheet of Agriculture*—household equipment and investments in cooperatives—as well as other personal assets owned by farmers, such as nonfarm investments and the cash value of life insurance policies, that are not included in the *Balance Sheet*. As in the *Balance Sheet*, all farm assets of the selected types are included in the totals, whether owned by farmers, nonfarm landlords, or other persons or institutions.

Composition and trends. The selected agricultural assets increased in value in every postwar year except 1950 and 1954, for a total gain of \$159.3 billion since the beginning of 1950. Annual increases during the 1950's averaged 4.5 per cent, fell to 3.4 per cent during 1960–64, but then accelerated to 5.9 per cent in the 1965–68 period.

Real estate remains the most important farm asset, and indeed its relative value rose from 62 per cent of total assets in 1950 to 72 per cent in 1969. Of the real estate value, perhaps one-fifth is contributed by

TABLE 1
VALUE OF SELECTED ASSETS USED IN AGRICULTURE

Asset	Billions of dollars					Per cent of total				
	1950	1955	1960	1965	1969	1950	1955	1960	1965	1969
Vehicles, machinery, and equipment	12.2	18.6	22.2	25.5	32.6	10	12	12	11	12
Livestock	12.9	11.6	15.2	14.5	20.1	11	7	8	6	7
Stored crops	7.6	9.6	7.7	9.2	10.5	6	6	4	4	4
Demand deposits and currency	7.0	6.9	6.2	5.9	6.3	6	5	3	3	2
Time deposits and savings bonds	6.8	7.5	7.6	7.9	9.0	6	5	4	4	3
Real estate	75.3	98.2	130.2	160.9	202.6	62	65	69	72	72
Total selected assets	121.8	152.0	189.1	223.9	281.1	100	100	100	100	100

SOURCE.—*The Balance Sheet of Agriculture, 1968*, USDA, Jan. 1969, pp. 10, and 26 and 27. Data are shown as of January 1 of each year.

farm dwellings and service buildings and the remaining four-fifths by land and land improvements.

In second place among asset groups, the machine stock—vehicles, machinery, and equipment—comprised 12 per cent of assets in 1969 and has roughly maintained this proportion since 1950. Livestock ranked third in 1969, at 7 per cent of the total. Stored crops and financial working balances each represented about 5 per cent and have been declining in relative importance.

Changes in asset values over 5-year intervals since 1950 are shown more explicitly in Table 2 (dollar changes occurring during 1965–68 were multiplied by 1.25 to express them as a 5-year rate comparable to the previous periods). Prominent features include the following: (1) increases in real estate values accounted for a large proportion—an average of 80 per cent—of the gain in total assets; (2) growth in value of machinery and livestock involved considerable sums in some years, but varied considerably over the period; and (3) asset growth in 1965–68 proceeded at an extraordinarily rapid rate, as growth in machinery, livestock, and real estate values each accelerated.

Real versus price changes. In contrast to the changes in current value discussed above, the total farm physical plant, often referred to as real assets, has expanded rather slowly since 1950 (Table 2).

According to USDA estimates, the selected farm assets, when valued at constant prices, rose by only 15 per cent in 1950–68. As the current value of these assets increased by 131 per cent, by implication the total price rise during the period was estimated as 101 per cent.

The separation of capital growth into its real and price components is important to analysis and projection of capital flows,

TABLE 2
CHANGES IN VALUE OF SELECTED ASSETS USED IN AGRICULTURE

Asset	1950-54	1955-59	1960-64	1965-69*
	5-year total (billions of dollars)			
Vehicles, machinery, and equipment	6.4	3.6	3.3	8.9
Livestock	-1.7	4.0	-7	7.0
Stored crops	2.0	-1.9	1.5	1.6
Demand deposits and currency	-1	-7	-3	.5
Time deposits and savings bonds .....	.7	.1	.3	1.4
Real estate	22.9	32.0	30.7	52.1
Total selected assets ...	30.2	37.1	34.8	71.5
Percentage change in current value				
Vehicles, machinery, and equipment	52	19	15	35
Livestock	-13	36	-5	48
Stored crops	26	-20	19	18
Demand deposits and currency	-1	-10	-5	8
Time deposits and savings bonds	10	1	4	17
Real estate	30	33	24	32
Total selected assets ...	25	24	18	32
Percentage change in real assets				
Vehicles, machinery, and equipment	37	-3	4	18
Livestock	11	..	7	2
Stored crops	11	3	-2	40
Demand deposits and currency	-10	-16	-12	-3
Time deposits and savings bonds	-1	-6	-3	2
Real estate	4	2	2	2
Total selected assets ...	8	0	2	6
Average annual percentage change in current value				
Vehicles, machinery, and equipment	8.8	3.6	2.8	6.3
Livestock	-2.7	6.3	-9	8.5
Stored crops	4.8	-4.3	3.6	3.4
Demand deposits and currency	-.3	-2.2	-1.0	1.6
Time deposits and savings bonds	2.0	.3	.8	3.3
Real estate	5.5	5.8	4.3	5.9
Total selected assets ...	4.5	4.5	3.4	5.9
Average annual percentage change in real assets				
Vehicles, machinery, and equipment	6.5	-.7	.8	3.4
Livestock	2.2	..	1.3	.5
Stored crops	2.1	.6	-.4	7.1
Demand deposits and currency	-2.2	-3.5	-2.4	-.6
Time deposits and savings bonds	-.3	-1.3	-.7	.4
Real estate .....	.8	.4	.4	.3
Total selected assets ...	1.4	0	.3	1.3

* Data shown for 1965-69 are actual values for 1965-68 multiplied by 1.25 to facilitate comparison with previous 5-year periods.

NOTE.—Users of the data on real assets are referred to p. 118-19 for a discussion of a probable bias in these estimates. SOURCE.—Table 1 and additional data from USDA.

simply because these flows over time differ for varying mixes of real and price increases in stock. Efforts to allocate changes in stock values to real and price components are

greatly handicapped, however, by the fact that capital goods change over time as technology advances. The tractors and land of today are not the same products as in 1950, and so one cannot be sure how much of the increase in their current price represents price inflation and how much is due to gains in quality or productivity of the assets. As such gains often occur in subtle ways that defy measurement, the USDA estimates of real assets may understate the progress that has occurred, and the price increase may therefore be overstated.

Nevertheless, it appears that real estate and machinery prices rose rather steadily during 1950–68, with very significant impact on total asset values. On the other hand, prices of livestock moved in a direction opposite to livestock numbers, so that when the real livestock inventory increased, its current value tended to decrease, as in 1950–54 and 1960–64.

The rate at which physical additions were made to stocks of machinery, livestock, and crops varied substantially from one period to the next. Machinery stocks were easily the most volatile component, with especially rapid increases in the early 1950's and again in 1963–67.

Projected capital stocks in 1980. Three widely circulated projections of 1980 stocks

constitute the point of departure for estimation of capital flows in the intervening period. The stocks projected for 1980 in current (1980) dollars are summarized in Table 3. To facilitate comparison with current values, Model NC (no change) shows the value of stocks (and later also of flows) if neither price nor real changes occurred after January 1, 1969.

The first set of projected stocks, Model HT, is based primarily on projections for 1960–79 published by Heady and Tweeten in 1963 after extensive econometric analysis of the determinants of demand for various farm capital goods.¹ The Heady-Tweeten projections were made in real terms only, but the machinery, financial assets, and real estate values shown in Table 3 are altered to reflect moderate price advances. For real estate, the current-dollar projection employs a Heady-Tweeten price equation that is relatively successful in explaining the postwar course of farmland values.

The second projection, Model B, is based on current-dollar projections of 1980 stocks published by Brake in 1966, with the real

¹ Earl O. Heady and Luther G. Tweeten, *Resource Demand and Structure of the Agricultural Industry* (Ames, Iowa: Iowa State University Press, 1963).

TABLE 3
ALTERNATIVE PROJECTIONS OF SELECTED FARM ASSETS

Asset	Model NC	Model HT	Model B	Model HM	Model NC	Model HT	Model B	Model HM
	Amount in 1980 (billions of dollars)				Change during 1970's (billions of dollars)			
Vehicles, machinery, and equipment . . .	32.6	40.5	36.4	64.2	...	7.3	3.5	29.6
Livestock	20.1	21.4	23.2	21.9	...	1.2	2.8	1.6
Stored crops	10.5	10.0	11.4	10.0	...	-.5	.8	-.5
Deposits, currency, and savings bonds . .	15.3	25.2	15.7	25.2	...	9.2	.4	9.2
Real estate	202.6	392.9	272.2	288.4	...	177.8	64.1	79.2
Total selected assets	281.1	490.1	358.9	409.7	...	195.0	71.5	119.1
	(per cent of total)				(average annual percentage change)			
Vehicles, machinery, and equipment . . .	12	8	10	16	...	2.0	1.0	6.4
Livestock	7	4	6	5	...	.6	1.3	.8
Stored crops	4	2	3	2	...	-.4	.7	-.4
Deposits, currency, and savings bonds . .	5	5	4	6	...	4.6	.2	4.6
Real estate	72	80	76	70	...	6.2	2.7	3.3
Total selected assets	100	100	100	100	...	5.2	2.2	3.5

estate estimate as updated by Brake in 1968.²

The final projection, Model HM, is based primarily on one of several projections of real stocks of machinery and livestock and of price changes of real estate published by Heady and Mayer in 1967, in a project executed for the National Advisory Commission on Food and Fiber.³ The estimates used here assumed that land retirement programs of the present "feed-grain" type are continued for wheat and feed grains and are also applied to cotton production, and that exports increase in accordance with 1950–65 trends. As with Model HT, the machinery and real estate projections were modified to reflect trends in machinery prices and in the general price level, respectively. In addition, because Heady and Mayer did not project values of stored crops or of financial assets, these items were projected at the same levels as in Model HT.

The three projections agree in one important respect: that the total value of farm assets will increase considerably during the next decade. Beyond this, there are differences that appear likely to have considerable impact on capital and credit demands: (1) the projected total increase in value varies from \$71.5 billion under Model B to \$195.0 billion under Model HT—an average difference of \$12 billion per year over the decade, and (2) growth projected for major asset components differs greatly. Model HT projects a relatively rapid rise in real estate values, but only moderate gains in the ma-

chine stock. The reverse is true of Model HM, whereas Model B anticipates relatively moderate growth in all components but with rising real estate values dominant.

In the next subsection, the bases for these stock projections are briefly noted, and the capital flow requirement that appears implied by each model is calculated. The framework for the analysis both here and in the next section draws heavily on the pioneering capital study of Tostlebe, which is also the source of many insights into long-term trends.⁴ A comprehensive and more recent capital and credit study by Johnson was also very useful.⁵

Capital requirements by asset group, 1950–79

Farm capital flows and credit demands arise in three important ways. First, they originate from expenditures to maintain or expand the capital plant. In this category one finds spending for (1) replacements and additions to the stock of vehicles, machinery, equipment, buildings, and land improvements; (2) additions to inventories of livestock and of crops stored for feed and seed; and (3) additions to financial working balances. Second, capital flows and credit demands arise when the capital plant—especially real estate—is transferred from one owner to the next by means other than gift or inheritance. Estimates for 1950–68 of the various capital flow requirements of these two types are summarized in Table 4. Third, seasonal credit demands occur when additional working capital is needed to finance seasonal production processes for

² John R. Brake, "Impact of Structural Changes on Capital and Credit Needs," *Journal of Farm Economics* (Dec. 1966), pp. 1536–45. Also "Dimensions of the Credit Door," unpublished speech at Blacksburg, Va., Aug. 5, 1968.

³ Earl O. Heady and Leo V. Mayer, *Food Needs and U.S. Agriculture in 1980*, Technical Papers, vol. 1, U.S. National Advisory Commission on Food and Fiber (Washington: Govt. Printing Office, Aug. 1967).

⁴ Alvin S. Tostlebe, *Capital in Agriculture: Its Formation and Financing Since 1870* (Princeton: Princeton University Press, 1957).

⁵ D. Gale Johnson, "Agricultural Credit, Capital and Credit Policy in the United States," *Federal Credit Programs*, Commission on Money and Credit (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), pp. 355–423.

TABLE 4
CAPITAL FLOWS, 1950-69

In billions of dollars

Type of flow	5-year total*				Annual average			
	1950-54	1955-59	1960-64	1965-69	1950-54	1955-59	1960-64	1965-69
Gross capital expenditures:								
Vehicles, machinery, and equipment ...	15.4	14.0	16.0	23.6	3.1	2.8	3.2	4.7
Buildings and land improvements	7.7	6.9	6.4	6.4	1.5	1.4	1.3	1.3
To increase:								
Livestock inventory	2.4	.5	1.3	.2	.5	.1	.3	...
Stored crop inventory .....	.4	.8	-.2	1.4	.1	.2	...	.3
Demand deposits and currency	-.1	-.7	-.3	.5	...	-.1	-.1	.1
Time deposits and savings bonds	1.7	.1	.3	1.4	.1	...	.1	.3
Required by real estate purchases	11.0	13.5	16.0	20.7	2.2	2.7	3.2	4.2
Total capital flow	37.4	35.1	39.4	54.2	7.5	7.0	7.9	10.8

* Data shown for 1965-69 are estimates for 1965-68 multiplied by 1.25 to facilitate comparison with previous 5-year periods.

SOURCE.—Machinery and building expenditures from *Farm Income Situation*, USDA, July 1969, p. 60; increase in live-

stock and crop inventories are unpublished data from USDA (livestock and crop total is published in *Farm Income Situation*, July 1969, p. 53); increase in financial assets from *The Balance Sheet of Agriculture, 1968*, USDA, Jan. 1969, p. 10; capital flows required by real estate purchases are estimated by Emanuel Melichar.

which the level of cash assets normally maintained does not fully provide. These seasonal demands are discussed in Section VI.

Vehicles, machinery, and equipment. Improved vehicles, machinery, and equipment (all grouped under "machinery") constitute a readily visible example of the impact of technological change on the capital goods of agriculture. And in addition to all the new equipment purchased for production on farms (with which this study is concerned), there has been considerable non-farm investment in such allied industries as hatcheries and feed mills, which perform work that in earlier years had been done on farms.

Expenditures for machinery now constitute a significant capital requirement, over two-fifths of the total flow. Analytically, these expenditures are of two types: to replace stock that has worn out or has become obsolete, and to expand the total stock in order to increase output or reduce labor requirements. Expenditures arising from either need are affected by the course of machinery prices.

To maintain the machine stock at a given real level requires an annual expenditure equal to about 14 per cent of the value of the stock, according to recent depreciation

allowances estimated by the USDA.⁶ With the stock valued at \$32.6 billion in 1969, annual replacement requirements are thus around \$4.6 billion.

Machinery prices, however, appear likely to increase over time. Prices set by manufacturers are likely to reflect the general upward course of unit costs in the capital goods sector of the nonfarm economy. The implicit price deflator for the total farm machine stock rose at annual rates of 4.4 per cent in 1955-59, 2.0 per cent in 1960-64, and 2.8 per cent in 1965-68. If, in view of this record, one projects annual machinery price increases averaging 2.5 per cent in 1969-79 and no real growth, the value of the stock would still rise to \$42.8 billion by 1980. Annual replacement requirements would by then average \$6.1 billion.

Any physical additions to the total stock constitute a capital flow requirement superimposed on the replacement expenditures. In this century, periods of rapid real expansion have alternated with extended periods of little or no growth. A spending boom that nearly tripled the real stock between 1945 and 1954 was succeeded by 10 years of little growth or of small declines. Re-

⁶ USDA, *Farm Income Situation* (Washington: Govt. Printing Office, July 1969), p. 61.

TABLE 5
PAST AND PROJECTED RATES OF CHANGE IN
MACHINE STOCKS AND PRICES, 1946-79
 Average annual rate of change, per cent

Period	Total	Real	Price
1946-48	23.2	18.4	4.0
1949-51	18.2	14.5	3.2
1952-55	3.7	2.7	1.0
1956-60	2.5	-1.3	3.9
1961-62	2.1	-0.8	2.9
1963-64	6.0	4.0	1.9
1965-67	6.7	3.8	2.8
1968	4.5	1.8	2.8
1970-79:			
Model HT	2.0	-0.5	2.5
B	.9	.3	.6
HM	6.2	3.6	2.5

NOTE.—Users of the data on prices and real stocks are referred to pp. 118-19 for a discussion of a probable bias in these estimates.

SOURCE.—Past annual rates of change in total stock were computed from data in *The Balance Sheet of Agriculture, 1968*, USDA, Jan. 1969, pp. 26 and 27. Estimates of past real stocks were supplied by the USDA. Price changes shown are for the implicit price deflator for the total machine stock, as computed from these two series.

newed rapid expansion beginning in 1963 lifted real stocks by another 23 per cent before 1969.

Some projections of machinery requirements emphasize the spur from continued technical innovation, combined with desires and incentives (higher wage rates) to reduce labor requirements. Such projections, as in Model HM, indicate substantial real increases in future machine stocks.

Other analysts have been more impressed with the substantial upgrading of stocks that can occur in the course of the large replacement expenditures. For instance, structural analysis by Heady and Tweeten suggested “a mature agricultural economy in terms of machinery. A large amount of new machinery will continue to be purchased not only to replace worn-out machines but also to substitute for machines that are inadequate for large holdings. This will offer sizeable opportunities for machinery to replace labor, despite the rather small increment in machinery assets.”⁷ This view is represented in Models HT and B.

The historical record since World War II taxes analysts seeking to determine the more appropriate view, as the growth rates shown in Table 5 demonstrate. Heady and Mayer analyzed the record of 1949-64 and found a strong upward trend over these years. The large expenditures shown for Model HM in Table 6 are based mainly on assumed continuation of this trend. In 1975-79, annual expenditures would average \$9.6 billion. But Heady and Tweeten, writing in the early 1960's, thought the relative stability of 1952-60 to be more representative of the future, and thus projected little real expansion. Brake, although writing in 1966 after expenditures had again accelerated, also expected relatively slow future growth. Models HT and B both project average annual expenditures of about \$5 billion in 1975-79, or little higher than those at the peak of the recent boom.

Buildings and land improvements. Construction of farm dwellings, service buildings, and various other structures and land improvements such as fences, wells, ponds, terraces, and tile lines comprises a substantial continuing capital expenditure, currently about 12 per cent of total capital

⁷ Heady and Tweeten, *op. cit.*, p. 492.

TABLE 6
ALTERNATIVE PROJECTED EXPENDITURES FOR MACHINERY
 In billions of dollars

Projection	5-year total						Annual average					
	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79
Actual	15.4	14.0	16.0	23.6*	...	...	3.1	2.8	3.2	4.7	...	...
Model NC	23.1	23.1	...	...	...	...	4.6	4.6
HT	24.3	26.8	...	...	...	...	4.9	5.4
B	24.4	25.5	...	...	...	...	4.9	5.1
HM	35.6	48.2	...	...	...	...	7.1	9.6

* Expenditures for 1965-68 multiplied by 1.25.

flow. In some regions, construction of items such as irrigation systems and commercial feed lots has been expanding. Nationally, however, expenditures have been declining absolutely as well as relative to other capital uses.

The downward drift in construction followed large gains in the years immediately after World War II. Expenditures for farm operators' dwellings reached a peak of \$702 million in 1948 but by 1968 were reduced to \$493 million. Construction of other buildings and land improvements topped at \$949 million in 1952 and was down to \$812 million in 1968.

One factor reducing new farm construction is the rapidly declining number of farm units and families. From 1950 to 1968, the number of farms fell by 46 per cent, or by about 2.6 million units. Each farmstead that was abandoned or became a rural residence for a nonfarm family tended to reduce future farm building needs.

In addition, expenditures for new service buildings have been negatively affected by various technological developments. Greater efficiency in livestock production—more milk per cow, faster growth of hogs and broilers—enabled farmers to increase output without proportional increases in animal housing space. Greater use of purchased mixed feeds and virtual elimination of horses and mules tended to reduce farm feed storage requirements. Less costly types of buildings, such as those employing pole-type construction, were increasingly adopted.

Projected construction expenditures used in Models HT, B, and HM are based on a recent study by Scott and Heady.⁸ They

⁸ John T. Scott, Jr., and Earl O. Heady, *Aggregate Investment Demand for Farm Buildings: A National, Regional and State Time-Series Analysis*, Research Bulletin 545 (Ames, Iowa: Agricultural and Home Economics Experiment Station, Iowa State University, July 1966), pp. 704–36.

project an average annual real decrease of 0.9 per cent and assume that prices of building materials will continue to rise at the 2 per cent annual average experienced from 1947 to 1963. Thus, yearly current-dollar spending would average \$1.4 billion during 1970 to 1974, and \$1.5 billion in 1975 to 1979.

Livestock inventory. Additions to the quantity of livestock on farms entail a capital flow equal to the value of the physical quantities added. There is general agreement that expanding domestic population and rising per capita income will continue to raise aggregate demand for livestock products, and that the greater output will require larger livestock inventories on farms. However, inventories are likely to rise more slowly than output. As Tostlebe noted after his study of 1890–1950, “the most significant technological advances in agriculture . . . have quite consistently been connected with the production of livestock and of livestock products. . . . Improvements in the breeds of livestock and in livestock feed and management have been sufficient to permit animal products to become increasingly important in the farm-product mix, while the investment in productive livestock per dollar of total farm product declined greatly.”⁹ This effect remains important. Excluding horses and mules, the number of animal units of breeding livestock on farms in 1967 was the same as in 1919 and somewhat below levels of the 1940’s and 1950’s. However, production per breeding unit was 116 per cent larger than in 1919, 38 per cent above that of 1950, and up 13 per cent since 1960.¹⁰ The larger numbers of feeder livestock and poultry have since 1950 required capital flows that varied

⁹ Tostlebe, *op cit.*, p. 126.

¹⁰ USDA, *Changes in Farm Production and Efficiency* (Washington: Govt. Printing Office) June 1955, p. 23; June 1968, p. 10.

greatly from year to year, but averaged only \$228 million annually (Table 4).

As with the machinery projections, analysts again apparently differ as to relative future impact on inventories of the divergent influences of greater consumer demand and increased production efficiency. Heady and Tweeten projected an average annual gain of only 0.75 per cent in the real livestock inventory, which would require yearly expenditures of about \$120 million during the next decade. But Heady and Mayer specifically assumed no further improvement in the inventory/output ratio and thus projected an average real gain of 2.8 per cent annually between 1965 and 1979. Even if livestock prices receded to 1965 levels by 1980, this growth would require expenditures of more than \$700 million annually during the 1970's. Brake also projected similar real growth, with 1980 prices 14 per cent over those of 1965. Annual expenditures of \$600 million would be required to achieve this projection.

Although the projections vary considerably, even a relatively faulty livestock forecast does not introduce a large relative error in projected total capital flows. Projected livestock expenditures have the greatest relative importance in Model B, but even there they account for only 5 per cent of total capital flows anticipated.

Inventory of stored crops. The value of net physical additions to farmers' holdings of stored crops constitutes a volatile but minor capital flow that averaged \$144 million annually in 1950-68. Diverse influences appear to be operating on the long-term trend. Larger livestock production leads to growth in feed inventories, but the rise is moderated by upward trends in the animal output obtained from a given quantity of feed and in the proportion of total feed purchased from commercial mixers. To the extent that feed inventories are held by feed companies

and dealers, the associated capital requirement has been transferred to the nonfarm economy.

Each capital model projects a continued small upward trend in real stocks. However, because 1969 inventories represent a considerable bulge over the long-term trend—one of several sizable fluctuations exhibited over the postwar period—these projections translate into a small amount of disinvestment between 1969 and 1980.

Financial assets. Farmers must hold money balances to carry on their business transactions, primarily involving payment for current operating and family living expenses. Historically, these balances have risen both in absolute terms and as a proportion of total assets, reflecting the growth of cash operating expenses as each farm unit has become less self-sufficient and more dependent on purchases from other farms or from the nonfarm sector.

During 1950-65, however, growth in money holdings was at least temporarily interrupted as farmers reduced their demand deposits and currency by \$1.1 billion, or 16 per cent. The upward trend in operating expenses continued during these years, but offsetting influences on the money stocks—such as the decline in the number of farms and in the farm population—were apparently more powerful. In addition, an upward movement in interest rates put an increasing opportunity cost on cash balances. Ready availability of seasonal production credit may also have enabled farmers to reduce the relative amount of cash assets held on January 1, the day on which these stocks are estimated for the *Balance Sheet*.

In response to higher interest rates paid on time and savings deposits and perhaps also as a result of improved farm financial management, farmers may have been more likely to hold seasonally-idle working capi-

tal in time and savings rather than demand deposits. Thus the change in these assets, which tended to increase during the post-war period, has been included among capital requirements. At the same time, farmers have reduced their holdings of U.S. savings bonds, which have also been included among the financial assets here enumerated.

Projection of financial balances must contend with these diverse influences. Heady and Tweeten projected a 23 per cent total real gain in cash for operating expenses between 1960 and 1980. To achieve this real growth as prices paid by farmers rise by an assumed 2 per cent a year, farmers would have to add \$917 million per year to their holdings of the financial assets listed. This estimate is used in Models HT and HM. But Brake projected a slow rise in current dollars; farmers would have to add only \$36 million annually to financial assets to fulfill his projection, which is used in Model B.

Real estate purchases. Most farm real estate is owned by individuals and is transferred from one owner to the next by sale rather than inheritance. Of the total number of transfers in the year ending March 1, 1969, for example, only 13 per cent were inheritance or gift transfers. Voluntary sales by retiring or retired farmers and others and by executors of estates averaged \$5.5 billion annually over the 4 years ending on March 1, 1969.¹¹ Thus, annual purchases of land are somewhat larger than expenditures for vehicles and machinery.

Capital flows required by land transfers are lower than the value of sales, however. The total capital flow required equals the money removed from the agricultural production sector by sellers who are retiring or retired farmers, nonfarmer heirs, or non-

farmer investors who are withdrawing from farmland ownership. To calculate the capital flow, therefore, the value of sales must be adjusted for the amount of outstanding debt on the property—which is either assumed by the purchaser or is repaid as a result of the sale—and also for the proceeds of land sales that are used to buy other farmland.

There is little data on which to estimate these adjustments and so derive required capital flows from value of sales. One indication of the amount of outstanding debt is provided by a 1967 survey showing that assumption of outstanding property mortgages accounted for 9 per cent of credit involved in land transfers, which puts assumptions at about 5 per cent of transfer value. A 1964 survey indicated that about 10 per cent of total voluntary sales were made by farmers who continued in farming after the sale, and who therefore may have bought other tracts with the proceeds.¹² No data seem to be available on debt repayments or on the subsequent activities of nonfarmer sellers.

For estimates of capital flows, land sales were adjusted downward by 25 per cent to obtain the capital flow required. In 1965–68, capital flows associated with real estate transfers were therefore estimated to average \$4.2 billion per year, or 38 per cent of total farm capital flows.

For the years prior to 1965, estimates are made still more difficult by lack of data on the value of real estate sales. For these years, only transfer rates and total real estate values are provided by the USDA. Since in 1965–68 the value of sales averaged 78 per cent of the figure obtained by multiplying the transfer rate by total value, this relationship was used to estimate capital flows required in 1950–64 (Table 7).

¹¹ USDA, *Farm Real Estate Market Developments* (Washington: Govt. Printing Office) Aug. 1969, p. 22; Mar. 1969, p. 11; Apr. 1968, p. 14; June 1967, p. 13.

¹² *Ibid.*, Dec. 1968, p. 23; Aug. 1965, p. 31.

TABLE 7

ALTERNATIVE PROJECTED CAPITAL FLOWS REQUIRED BY REAL ESTATE PURCHASES

In billions of dollars

Projection	5-year total						Annual average					
	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79
Estimated actual	11.0	13.5	16.0	20.7*	...	...	2.2	2.7	3.2	4.2	...	...
Model NC					22.7	22.6					4.5	4.5
HT					28.1	37.3					5.6	7.5
B					24.9	28.0					5.0	5.6
HM					25.4	29.3					5.1	5.9

* Estimated flows in 1965-68 multiplied by 1.25.

The estimates indicate a steady upward trend that about doubled the required flow between 1950 and 1968, as the effect of higher land prices easily overwhelmed the effect of lower transfer rates.

The same relationships were used in projecting future capital flows. With a continued small decline in the transfer rate, required annual capital flows would average about 2.2 per cent of any projected value of the real estate stock. Thus if the value of land and buildings were to stabilize at the 1969 level, as in Model NC, the transfer capital required would be \$4.5 billion per year. In the other models, the capital flows depend on the projected course of real estate prices.

An econometric study by Tweeten and Nelson that attempted to measure the relative strength of pressures on farmland prices in 1950-63 ascribed 52 per cent to farm enlargement (of which an unspecified portion was thought due to Government programs), 20 per cent to demand for nonfarm uses, 17 per cent to the expectation of further capital gains, and most of the remainder to reduction in quantity of land.¹³ Since the land price index was deflated by the wholesale price index prior to analysis, participation by farmland in a general price

uptrend was also assumed. Because of the many alternative ways in which a land-price model could be specified and estimated, this one study is not definitive. But perhaps it indicates the principal forces bearing on land prices and exerting through them a major influence on capital and credit requirements.

In this view, the basic factor behind increases in land prices is technological change. First, innovations have increased the productivity of land. Higher crop yields resulting from new technology and better management have tended, *ceteris paribus*, to lower unit production costs and increase net returns. Second, other new technologies—principally larger tractors and machines—have permitted a farmer to operate a larger land area and thereby also to lower unit overhead costs.¹⁴ This incentive to enlarge farm units has created an active demand for land. Competitive bidding among the more successful farmers—those able to achieve above-average net returns from each added tract—has led to increased prices; in effect, the higher net returns have been capitalized into land prices.¹⁵ Also, as this experience prevails over many years,

¹⁴ *Ibid.*, pp. 45-47.

¹⁵ Albert A. Montgomery and Joseph R. Tarbet, "Land Returns and Real Estate Values," *Agricultural Economics Research*, USDA (Washington: Govt. Printing Office, Jan. 1968), pp. 5-16. William H. Scofield, "Land Prices and Farm Earnings," *Farm Real Estate Market Developments*, USDA (Washington: Govt. Printing Office, Oct. 1964), pp. 39-42.

¹³ Luther G. Tweeten and Ted R. Nelson, *Sources and Repercussions of Changing U.S. Farm Real Estate Values*, Technical Bulletin T-120 (Stillwater, Okla.: Oklahoma State University Agricultural Experiment Station, Apr. 1966), p. 18.

the upward course of land prices is probably further reinforced as buyers discount expected future advances in technology and therefore in net returns—or, what is equivalent if less sophisticated, they discount capital gains from an expected future upward trend in land prices.¹⁶

Much of the same new technology that reduced unit costs, however, also tended to increase total farm output.¹⁷ Output gains could occur in two ways: through improvement in inputs and farming practices and as farm consolidation places more of the total resources into the hands of the more efficient and specialized operators. Government output control programs kept the potential output increase from being fully achieved, but the gain has been sufficiently large relative to the slower expansion of demand to exert a depressing influence on output prices. The latter effect tended to offset the favorable impact of unit cost reductions on net returns and would have been more pronounced in the absence of the Government programs.¹⁸

In these circumstances the commodity programs, by restricting total production and either maintaining output prices or supplementing net incomes, have allowed a higher portion of the benefits of cost-reducing technology to accrue to farmers rather than to consumers. To the extent that Government programs have thus preserved the technologically induced gains in net returns that have in turn been capitalized into land prices, such programs may contribute to the rise in land prices.¹⁹ The effect has been particularly obvious in cases where benefits

of an effective program have been tied to specific parcels of land; for instance, land with a tobacco allotment has been valued at several times the price of similar land that lacked an allotment.²⁰

Insofar as the future course of real estate values depends on technological advances and the extent to which these foster further farm enlargement, their direction in the relatively near future does not seem in doubt. Numerous studies continue to indicate that the optimum sizes of family farms—given known technology—are far above present averages. It is reasonable that price projections to 1980, as made in the three models, be based mainly on the upward thrust from this source, but with realization that prices can be materially affected within that time by changes in the nature and extent of Government programs and in export levels, general price trends, and the degree to which expected land price increases are discounted. Over a longer period, changes in the rate and nature of technological advances—particularly in the extent to which they would continue to foster enlargement of the land area of individual farms—become a greater source of uncertainty.²¹ Changes in population growth and in the nature of urban appetites for residential and recreational lands also become larger considerations.

Of the projected real estate values, that of Model HT represents most closely an extension of the past historical relationship between land prices and farm enlargement. Prices are projected to rise by 6.2 per cent

¹⁶ Tweeten and Nelson, *op. cit.*, pp. 19–22.

¹⁷ Gene L. Swackhamer, "Agriculture and Technology," *Monthly Review*, Federal Reserve Bank of Kansas City (May–June 1967), pp. 5 and 6.

¹⁸ Tweeten and Nelson, *op. cit.*, pp. 23–25.

¹⁹ *Ibid.*, pp. 15–18 and 47.

²⁰ William H. Scofield, "Land Returns and Farm Income," *Farm Real Estate Market Developments*, USDA (Washington: Govt. Printing Office, Aug. 1965), p. 51.

²¹ Bruce B. Johnson, "An Active Land Market in Perspective," *Farm Real Estate Market Developments*, USDA (Washington: Govt. Printing Office, Dec. 1968), pp. 34 and 35.

annually, causing required transfer capital flow to rise rapidly to an annual average of \$7.5 billion in 1975-79 (Table 7). In Model HM, on the other hand, an average yearly price increase of 3.3 per cent is derived by assuming that land values will reflect projected increases in the economic rent to cropland as well as general price inflation averaging 2 per cent yearly. Annual capital flows required by this model attain an average level of only \$5.9 billion in 1975-79. Model B reflects Brake's assumption that land prices will rise by an average of 3 per cent yearly, with implied capital flows therefore similar to those of Model HM.

Total capital flows, 1950-79

Total capital flows—past, present, and projected—are summarized in Table 8.

In the 1950's, total flows averaged \$7.3 billion annually. Real estate purchases rose throughout the decade, but in the second half machinery expenditures and additions to livestock inventory slackened enough to stabilize the total. In 1960-64, additions to machinery and livestock holdings were resumed and together with increasing real estate purchases raised total flows to an average of \$7.9 billion per year. Then in 1965-68, a sharp increase in machinery expenditures and a steady rise in land prices combined to raise capital flows to an annual average of \$10.8 billion.

If the capital stock were to be stabilized at the level existing at the beginning of 1969, both in real terms and in current dollars as Model NC assumes, future capital flows would average \$11.3 billion per year. About two-fifths of this sum would arise from real estate transfers, a similar share from expenditures required to maintain the stock of vehicles and machinery, and the remaining one-fifth from maintenance of the stock of buildings and land improvements.

It is evident, therefore, that any further increases in prices of capital goods and any further additions to the physical plant would raise total capital flows above the present level. Each of the other three models envision some price and real increases during the next decade and therefore project higher capital requirements. They differ only in the magnitude of the increases in requirements expected.

Model B, which projects moderate land price increases and small gains in machinery expenditures, envisions only a moderate gain in the required capital flow. By the second half of the next decade, annual flows would average \$12.8 billion. Real estate transfers would rise somewhat in relative importance, from 38 per cent of total flow in the period 1965-68 to 44 per cent a decade later.

Model HT projects only moderate gains in machinery expenditures and very small additions to livestock inventories, but strong increases in farmland prices. By 1975-79,

TABLE 8
ALTERNATIVE PROJECTED TOTAL CAPITAL FLOWS
 In billions of dollars

Projection	5-year total						Annual average					
	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79
Estimated actual	37.4	35.1	39.4	54.2*	...	...	7.5	7.0	7.9	10.8	...	...
Model NC					56.2	56.8					11.2	11.4
HT					63.7	76.8					12.7	15.4
B					59.0	64.0					11.8	12.8
HM					75.9	94.4					15.2	18.9

* Estimated flows for 1965-68 multiplied by 1.25.

required capital flows would consequently average \$15.4 billion per year, with real estate transfers contributing 49 per cent of this total.

Model HM, on the other hand, projects moderate increases in prices of land, but very large real additions to machinery stocks. Because of the latter, the capital flows projected are the largest of the three models, averaging \$18.9 billion annually during the late 1970's. Of this total, 52 per cent would consist of machinery expenditures and only 31 per cent would stem from real estate purchases.

The projections differ considerably. But to emphasize the differences, and the unknowns that they reflect, would be to lose the principal message of the estimates. Recall that over the past 10 years annual capital flows rose by \$4 billion; in relative terms, by 54 per cent. The projections for the next decade show annual requirements rising by \$2 to \$8 billion; in relative terms, by 19 to 75 per cent. The message is clear: capital demands will rise further from the high level of the last few years; in number of additional dollars, the gain could easily exceed that of the last 10 years; relative to the new high level of current requirements, the additional demands may represent a somewhat slower advance, but under some conditions might equal or exceed the recent sharp rise.

The unanimous projection of a significant further increase in capital flows appears well grounded. The two primary sources of future capital flows—machinery purchases and farm enlargement—have a common root in technological advance. The fund of technological knowledge now available but not yet applied and the high likelihood of additional discoveries indicate that growth in total investment and investment

per farm will continue for some time.²² The National Advisory Commission on Food and Fiber recently summarized these expectations as follows:²³

There is little doubt that farming will continue to use more capital in the future.

First, science and technology are continually advancing not only in application to farming but throughout the economy.

Second, reflecting increased productivity, the relative cost of capital keeps declining. Capital becomes continually cheaper, compared with labor and land, so farmers will continue to use more capital.

These changes not only make it possible for the individual farmer to increase his volume of operations—they make it necessary for him to do so. He must expand his investment and then spread costs over more units of product to remain competitive.

Thus, even though agriculture is already one of the more capital-intensive sectors of the American economy, a further rise in the capital/output ratio in current prices seems certain. The ratio of the value of farm productive assets to the gross national product produced in agriculture has been estimated as at least 6:1 in the 1950's compared with a ratio of about 1.5:1 in the nonfarm economy.²⁴ By 1964–66, the ratio in agriculture averaged 8:1. These data hint that the annual capital demands of farming place a relatively severe and rising strain on the income flows from which they are either initially or ultimately financed. These relationships are examined next—first as they have evolved since 1950, and then as they might develop under each of the alternative capital projections.

²² Federal Reserve Bank of Kansas City, "Financial Requirements of Agriculture," *Monthly Review* (Sept.–Oct. 1964), pp. 5–7.

²³ U.S. National Advisory Commission on Food and Fiber, *Food and Fiber for the Future* (Washington: Govt. Printing Office, July 1967), p. 240.

²⁴ D. Gale Johnson, *op. cit.*, p. 355.

IV. CREDIT REQUIREMENTS, 1950-79

Given the prospect of substantial capital flow requirements, this section projects the share that will be financed from cash flow—depreciation allowances and net income—as opposed to the share financed by expanded use of credit. Thus, one preliminary task is to project depreciation and net income, and the other is to project the share of these amounts that may be allocated toward meeting capital needs. After examination of the postwar history of these series, such projections of internal financing are made here. They are then compared with the projected capital flows to secure estimates of future credit demands and farm debt expansion.

How have capital requirements been financed?

It is analytically useful to view capital flows required by the farm production sector—including nonfarm landlords—as being met either (1) from a cash flow consisting of income remaining after operating expenses are paid or (2) by borrowing.²⁵

Financing from cash flow. Cash flow is estimated as the sum of net farm income of operators and landlords, plus the capital consumption allowances that were included in estimated production expenses (estimated depreciation of buildings, land improvements, vehicles, machinery, and equipment, as well as accidental damage to these capital goods), plus nonfarm income of the farm population. Nonfarm income is included in cash flow because most farm families apparently continue to pool farm and nonfarm income prior to meeting living and capital investment needs. Nonfarm income of farm landlords is not included because such

investment is expected to pay its own way from farm income and land price appreciation.

Of total annual cash flow averaging \$32.5 billion in 1965–68, net farm income represented 50 per cent, capital consumption allowances 17 per cent, and nonfarm income 33 per cent (Table 9). Although the principal component is still net farm income, its relative importance has been declining. Fifteen years earlier it had contributed 61 per cent, while capital consumption allowances had represented 13 and nonfarm income only 26 per cent.

TABLE 9

FINANCING OF CAPITAL FLOWS, 1950-69
In billions of dollars unless otherwise indicated

Sources of—	1950-54	1955-59	1960-64	1965-69
	5-year total*			
Capital financing				
Increase in debt	4.7	8.2	12.4	20.0
From cash flow	32.7	27.0	27.0	34.3
Total capital flow ...	37.4	35.1	39.4	54.2
Cash flow				
Capital consumption allowances	16.2	19.6	22.0	27.7
Net farm income	73.9	63.3	68.3	80.9
Nonfarm income	31.9	33.1	40.7	54.0
Total cash flow	122.0	116.0	131.0	162.5
	Annual average			
Capital financing				
Increase in debt .....	.9	1.6	2.5	4.0
From cash flow	6.5	5.4	5.4	6.9
Total capital flow ..	7.5	7.0	7.9	10.8
Cash flow				
Capital consumption allowances	3.2	3.9	4.4	5.5
Net farm income	14.8	12.7	13.7	16.2
Nonfarm income	6.4	6.6	8.1	10.8
Total cash flow	24.4	23.2	26.2	32.5
	Per cent			
Analytical ratios				
Capital flow/cash flow	31	30	30	33
Proportion of cash flow used for capital ...	27	23	21	21
Average annual growth rate during period:				
Selected assets				
(Table 2)	4.5	4.5	3.4	5.9
Debt	7.6	8.9	8.8	9.6
Debt/assets, end of period	10.2	12.5	16.1	18.5†

* Data shown for 1965-69 are estimates for 1965-68 multiplied by 1.25 to facilitate comparison with previous 5-year periods.

† As of Jan. 1, 1968.

SOURCE.—Capital flows from Table 4, debt from Table 13, assets from Table 2, and cash flow components from *Farm Income Situation*, USDA, July 1969, pp. 48, 52, 57, and 61.

²⁵ Tostlebe, *op. cit.*, p. 132.

Cash flow averaged \$24.4 billion annually in the first 5 years of the 1950's, declined slightly when farm income dropped in the next 5-year period, more than made up this loss during the first half of the 1960's, and then jumped to an annual rate of \$32.5 billion in 1965-68. In this last period, however, the relative gains in cash flow did not keep up with those in required capital flows. Whereas capital flow averaged 30 per cent of cash flow in the 1950's and early 1960's, this ratio increased to 33 per cent in 1965-68 (Table 9). Thus the burden posed by capital requirements, viewed in relation to the cash flow from which they might be financed, has increased.

Over the 1950's, when the relative capital burden was running at about 30 per cent of cash flow, farmers progressively reduced the proportion of cash flow they devoted to meeting capital requirements. In the first half of the 1950's, the 27 per cent of cash flow that was used for capital purposes met the bulk of capital requirements. By the early 1960's, however, only 21 per cent of cash flow was being used for capital purchases, and the same share was also used in 1965-68 in spite of relatively greater capital spending.

Relative reliance on credit, 1950-68. Credit thus became increasingly important as a source of funds for capital expenditures. In the early 1950's, only 13 per cent of capital flows were met by an increase in debt. Ten years later this ratio had risen to 32 per cent, and by 1965-68 it averaged 37 per cent.

One must go back 50 years to find a similar degree of reliance on credit. Writing in the 1950's, Tostlebe noted:²⁶

To a remarkable degree, farmers have financed the increase in farm capital with their own incomes and savings. A comparison of the volume

of new capital that was financed by loans and book credits with that which was financed with funds derived from gross farm income and savings shows that in every decade for which we have information, save the one immediately preceding 1920, farmers supplied by far the greater part of the funds that financed the capital acquisitions.

A few years later, Johnson was still able to state:²⁷

... even when it is assumed that all increases in loans and credit were used to increase agricultural assets, their contribution has generally been less important over the past two decades [1940-59] than either depreciation or net income as a source of financing.

According to our estimates, however, in 1958 credit became a more important source of capital than net income. In fact, increases in debt have recently rivaled depreciation allowances for the lead in supplying capital, whereas 10 years earlier they were only one-third as large.

Thus, in projecting credit demands it is not enough to cite the capital flows anticipated. It appears equally important to project the cash flow and also the proportion of that flow that farmers will be willing or forced to apply to satisfaction of the projected capital needs. In so doing, additional uncertainties are obvious. Is a major change in net income probable? Has the postwar trend toward less internal financing reached its lowest point? How probable is a higher savings rate in the near future?

Current factors affecting credit use. In the last period of markedly increased participation of creditors in the financing of agriculture, that of 1900-20, Tostlebe found two primary factors in operation. One was the pressure of financing farm transfers at the newly inflated prices.²⁸ Physical farm enlargement was not a major factor, but the average dollar value of assets per farm rose

²⁷ D. Gale Johnson, *op. cit.*, p. 377.

²⁸ Tostlebe, *op. cit.*, pp. 140 and 145-147.

²⁶ *Ibid.*, p. 19.

by 79 per cent between 1900 and 1910 and by 91 per cent between 1910 and 1920.²⁹ Tostlebe also speculates that family living offered stiff competition for available funds:³⁰

First, and most important, inflated expenditures for family living probably made heavy inroads on the incomes of many farmers. The rise in prices of that period made necessary much greater outlays to maintain the prewar level of living. But more than that, the prosperity of the times encouraged farmers to spend freely, so that the level of living for many farmers was substantially higher during this period than before.

These elements appear in the current situation, although they do not seem to dominate it. Typical farms are now so large that an average person seeking to enter farming through purchase necessarily has to borrow a large portion of the funds required. Also, family farms approaching optimum size increasingly represent a quantity of assets that a typical farmer is not expected to save during a lifetime, and so farmers are more likely to remain indebted throughout their career. On the other hand, in these circumstances, alternatives to the use of credit—leasing of land and equipment from nonfarm investors, vertical integration, or corporate ownership—are spreading and lessening the credit demands made directly by farmers, although probably increasing credit demands of these other entities of the farm production sector.

The desire to raise family living levels may also be a powerful factor in current borrowing. National television networks have exposed farmers more to consumer amenities. Among landowners, income after depreciation and expansion allowances might not permit a significant rise in living conditions, but paper capital gains may have imparted a sense of financial prosperity

reflected in spending. Several authors have noted that short of selling their land, farmers can tap these gains only by offering them as collateral for increased debt. This process has probably occurred in subtle ways. Perhaps depreciation allowances, which after all look just like net income, are consumed in current living, and the tractors that were purchased for cash 10 years ago are today bought on the instalment plan. Or, instead of saving toward a downpayment on the adjacent "80," a farmer simply plans to use his inflated equity in his present holdings to effect a completely debt-financed purchase.

The attitudes of farmers and lenders toward the future of farming and toward what constitutes appropriate uses and terms of farm credit are obviously important determinants of the proportion of capital needs financed by debt. Farmers must be willing to borrow and lenders to lend if outstanding credit is to increase—and both were obviously willing over the last 20 years. The outlook for product and land prices must be important in the determination of these attitudes. In recent years, lenders that identify their interests most closely with those of agriculture—retiring farmers and the cooperative credit system—have provided a larger share of credit, and other lenders have employed more agriculturally trained loan officers. Thus, it is not surprising that the outlook and attitudes of borrowers and lenders have apparently tended to coincide.

The question of attitudes leads into the dominant feature of the present situation—farm enlargement—that was largely absent in the previous period. According to Tostlebe, average physical assets per farm nationwide remained almost unchanged between 1870 and 1940, although their composition was altered.³¹ A slow decline in the size of Southern farms concealed a

²⁹ *Ibid.*, p. 85.

³⁰ *Ibid.*, p. 145.

³¹ *Ibid.*, p. 85.

slow increase in the size of Midwest and Western enterprises, but nowhere did expansion match that started in the 1940's. Since then, the benefits of, or competitive necessity for, enlargement became more obvious to farm lenders. In fact, numerous educational efforts attempted not only to instruct lenders in these matters, but also to advise them to tell farmers about the need to expand in order to raise income and about how credit could assist this endeavor. Greater appreciation of the leverage that could be attained through credit was instilled in lender and farmer alike.

The importance of these considerations emerged in the 1960 Sample Survey of Agriculture, in which a large national sample of farmers for the first time was asked to enumerate debts owed to various sources. About 58 per cent of all farmers were indebted to varying degrees. When Garlock compared indebted operators to those without debt, he found that:³²

Regardless of whether the farmers were classified by age, years on the farm, tenure, or type of farm they operated, the indebted farmers, on the average, conducted larger-scale operations than the debt-free farmers. The value of the land and buildings they operated was greater, they leased more land, and they owned more land. Also they sold products of greater value, earned more net cash income from farming, and had larger off-farm incomes and more net income from all sources than did the debt-free farmers.

Although credit was indispensable to indebted farmers in building up and operating large farm businesses, it is questionable whether use of credit was fundamentally responsible for their larger, more profitable operations. What the data probably mean is that the farmers who used credit were more energetic and aggressive, more willing to take risks, and less willing to work only with the assets they owned outright than were the debt-free farmers. This is indicated by their more extensive use of leased land as well as by their use of credit.

³² Fred L. Garlock, *Farmers and Their Debts . . . The role of credit in the farm economy*, Agricultural Economic Report No. 93, USDA (Washington: Govt. Printing Office, June 1966), pp. 8 and 9.

These expansionist characteristics of the credit users—particularly the heavy credit users—are pointed up more sharply when farmers are classified according to the extent of their indebtedness. . . . Despite their small equities, the most heavily indebted farmers owned farms of nearly as high value as those owned by the debt-free farmers. But the most significant point is the extent to which the indebted farmers used their equities as a fulcrum for developing larger operations than their own financial resources would support. The most heavily indebted farmers owned 3½ times as much land, and operated 6 times as much land, as they could have owned or operated without borrowing and leasing. By using these methods of expanding operations, they raised their net cash farm incomes to levels approximating those of the other groups whose equities were much greater.

In the past, these expansionary desires, grounded in the economics cited by Garlock, might have been financed in large part by saving. But in view of the fact that many farmers have come to regard credit as an appropriate tool for achieving these ends, that lenders encourage this use of credit, and that both young farmers and holders of paper gains are probably disinclined to postpone attainment of family living goals, a continued high or perhaps even increased use of credit relative to required capital flow seems probable as long as the factors forcing farm enlargement continue operative. These have been found to be rooted in technological innovation and seem in no danger of expiring before 1980. They have already been found responsible for higher capital requirements and now are also found responsible for greater relative use of credit in meeting these requirements, given the farm income situation since 1950. Barring a drastic rise in net farm income, it seems reasonable to expect a savings rate no higher than that of the 1960's. On the other hand, if real net income per farm rises at a reasonable pace, there would be no great pressure to reduce the savings rate. The credit projections that follow incorporate this reasoning.

Projected credit requirements, 1970–79

The analytical framework outlined above and exemplified by Table 9 can be used to project credit requirements to 1980 under the various capital models that have been developed. For each past period shown in Table 9, capital flow, capital consumption, net income, and increase in debt were all known, and thus the amount of cash flow that was used to meet capital requirements could be obtained by subtraction. For the projections, however, only the capital flows and the capital consumption allowances that are consistent with these flows are initially given. But if the course of net farm and non-farm income is projected, the total cash flow becomes known. Then, if a further projection is made about how much of their cash flow farmers will devote to meeting capital requirements, the amount of increase in borrowing—the credit requirement—can be determined as the residual.

Internal financing in the 1970's. To project internal financing, the course of net farm income, nonfarm income of farmers, and the savings rate must first be estimated.

Instinctively, one wants to project total net farm income by projecting gross farm income and production expenses and calculating the difference. But a different approach is taken here, based on the belief that over a period of years (1) advances in real per-farm income will parallel gains in per capita income achieved in the nonfarm economy; (2) technological advances will cause farm numbers to decline independently of the course of farm income; and (3) the general price level will tend to rise.

These trends have been in evidence over the postwar period. Between 1958 and 1968, for example, operators' real net farm income per farm (income adjusted for changes in the index of prices paid by farmers) rose by 3.3 per cent annually, while

national per capita real personal income rose at a yearly rate of 3.4 per cent. However, the number of farms decreased by 3.2 per cent annually, and so total real operators' net farm income was unchanged. On the other hand, prices paid by farmers rose at an average annual rate of 1.6 per cent, and so total net farm income in current dollars increased at the same rate.

For the 1970's the National Planning Association projects an annual advance of 3.25 per cent in national per capita real personal income.³³ In the long run, the interplay of competitive and political forces will tend to ensure that farmers participate to roughly the same extent in this advance in the national level of living. At the same time, as farm enlargement continues and farm numbers therefore decline, this rate of gain in real income per farm may be achieved by a merely stable total real net income. However, if prices paid by farmers tend to rise by an average of 2 per cent annually, as is projected in Models HT and HM, total net farm income would also have to rise by 2 per cent annually to yield the projected real gains.

Note that this projection of net farm income implicitly requires that gross income rise sufficiently not only to provide the increase in net income, but also to cover any rise in production expenses (including interest payments on projected increases in debt) and in projected depreciation allowances.

Total nonfarm income of the farm population has been rising rapidly and the trend is expected to continue as nonfarm employment and investment opportunities become increasingly available to rural residents.

³³ Ahmad Al-Samarrie, Morris Cobern, and Take-shi Hari, *National Economic Projections to 1978/79* (Washington: National Planning Association, Jan. 1969), p. 117.

Between 1958 and 1968, nonfarm income rose at an annual rate of 5.8 per cent in spite of an average yearly drop of 4.8 per cent in the farm population. For the 1970's, total nonfarm income is projected to increase by 5 per cent annually, with two-fifths of the gain reflecting projected price inflation.

To summarize the cash flow projections, net farm income is projected to increase from \$16.1 billion in 1968 to an annual average of \$17.4 billion in 1970-74 and \$19.3 billion in 1975-79. Annual nonfarm income is projected to rise from \$11.8 billion in 1968 to an average of \$14.3 billion in 1970-74 and \$18.3 billion in 1975-79. Capital consumption allowances, which vary among the capital models according to the

growth of the machine stock foreseen, are projected at annual levels of \$7 billion to \$8 billion in 1970-74 and \$7 billion to \$10 billion in 1975-79. Total cash flow, which was \$34 billion in 1968, is therefore projected to rise to about \$39 billion per year in 1970-74, and about \$45 billion in 1975-79, with some variation among models as shown in Table 10.

Of this cash flow, 21 per cent is projected to be allocated to meeting capital requirements—the same proportion that was so allocated on average during 1960-68. Internal financing of capital flow is thus expected to average about \$8 billion per year in 1970-74 and \$9 billion to \$10 billion in 1975-79, up from the average of \$6.9 billion in 1965-68.

TABLE 10
PROJECTED FINANCING OF ALTERNATIVE CAPITAL FLOWS

In billions of dollars unless otherwise indicated

Sources of —	1970-74				1975-79			
	Model NC	Model HT	Model B	Model HM	Model NC	Model HT	Model B	Model HM
	5-year total							
Capital financing								
From cash flow (21 per cent of cash flow)	40.4	40.8	40.5	41.5	46.7	47.6	47.0	49.9
Increase in debt	15.8	22.9	18.5	34.4	10.0	29.3	17.0	44.5
Total capital flow	56.2	63.7	59.0	75.9	56.8	76.8	64.0	94.4
Cash flow								
Capital consumption allowances	33.6	35.5	34.3	38.9	34.5	38.4	35.8	49.6
Net farm income	87.1	87.1	87.1	87.1	96.5	96.5	96.5	96.5
Nonfarm income	71.7	71.7	71.7	71.7	91.5	91.5	91.5	91.5
Total cash flow	192.4	194.3	193.1	197.7	222.5	226.4	223.9	237.6
	Annual average							
Capital financing								
From cash flow (21 per cent of cash flow)	8.1	8.2	8.1	8.3	9.3	9.5	9.4	10.0
Increase in debt	3.2	4.6	3.7	6.9	2.0	5.9	3.4	8.9
Total capital flow	11.2	12.7	11.8	15.2	11.4	15.4	12.8	18.9
Cash flow								
Capital consumption allowances	6.7	7.1	6.9	7.8	6.9	7.7	7.2	9.9
Net farm income	17.4	17.4	17.4	17.4	19.3	19.3	19.3	19.3
Nonfarm income	14.3	14.3	14.3	14.3	18.3	18.3	18.3	18.3
Total cash flow	38.5	38.9	38.6	39.5	44.5	45.3	44.8	47.5
	End of period							
Assets and debt								
Selected assets	281.1	378.6	320.5	344.2	281.1	490.1	358.9	409.7
Outstanding debt	71.5	78.9	74.3	92.3	81.6	108.1	91.3	136.8
	Per cent							
Analytical ratios								
Capital flow/cash flow	29	33	31	38	26	34	29	40
Increase in debt/capital flow	28	36	31	45	18	38	27	47
Average annual change during period:								
Selected assets .....	...	5.1	2.2	3.4	...	5.3	2.3	3.5
Outstanding debt	5.1	7.1	5.9	9.8	2.7	6.5	4.2	8.2
Debt/assets, end of period	25.4	20.8	23.2	26.8	29.0	22.1	25.4	33.4

Projected debt expansion under alternative capital models. For each capital model, the projected increase in outstanding farm debt consists of the difference between the capital flow and the internal financing projected by that model. These calculations are shown in Table 10, and the resulting debt projections are summarized in Table 11.

Under Model NC, in which farm assets remain unchanged in value, substantial but decreasing annual additions to debt would still be required, and outstanding debt would reach \$81.6 billion in 1980, up from \$52.0 billion in 1969. Thus it appears that farmers would for some time tend to incur sizable amounts of new debt simply in the course of replacement and transfer of today's capital plant at today's prices. In Model B, in which capital flows advance moderately, outstanding farm debt would reach \$91.3 billion in 1980. The rate of debt expansion would fall to an annual rate of about 4 per cent by 1980, compared with the actual rate of 9.6 per cent in 1965-68. However, debt would grow more than twice as rapidly as assets and in 1980 would constitute 25 per cent of assets, compared with 19 per cent in 1968.

The relatively greater land price increases projected in Model HT would lead to an outstanding farm debt of \$108.1 billion in 1980. Annual gains in debt would average about 7 per cent; in dollars, the annual increase during 1975-79 would average \$5.9 billion. However, because of the large rise in farm real estate values projected by this model, the ratio of debt to assets would rise only slowly, to perhaps 22 per cent in 1980.

Model HM represents the greatest increase in capital flows, resulting mainly from large real additions to farm machine stocks. Outstanding debt would continue to grow almost as fast as in recent years and

TABLE 11
ALTERNATIVE PROJECTED CREDIT REQUIREMENTS

In billions of dollars unless otherwise indicated

Projection	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79
Debt: increase during period						
Actual Model NC	4.7	8.2	12.4	20.0*	15.8	10.0
HT	.....	.....	.....	.....	22.9	29.3
B	.....	.....	.....	.....	18.5	17.0
HM	.....	.....	.....	.....	34.4	44.5
Debt: average annual increase						
Actual Model NC	.9	1.6	2.5	4.0*	3.2	2.0
HT	.....	.....	.....	.....	4.6	5.9
B	.....	.....	.....	.....	3.7	3.4
HM	.....	.....	.....	.....	6.9	8.9
Outstanding debt: end of period						
Actual Model NC	15.4	23.6	36.0	56.0*	71.5	81.6
HT	.....	.....	.....	.....	78.9	108.1
B	.....	.....	.....	.....	74.3	91.3
HM	.....	.....	.....	.....	92.3	136.8
Outstanding debt: annual growth rate (per cent)						
Actual Model NC	7.6	8.9	8.8	9.2*	5.1	2.7
HT	.....	.....	.....	.....	7.1	6.5
B	.....	.....	.....	.....	5.9	4.2
HM	.....	.....	.....	.....	9.8	8.2
Debt/asset ratio: end of period (per cent)						
Actual Model NC	10	12	16	19†	25	29
HT	.....	.....	.....	.....	21	22
B	.....	.....	.....	.....	23	25
HM	.....	.....	.....	.....	27	33

* Estimate based on data in Table 9.

† As of Jan. 1, 1968.

would reach \$136.8 billion in 1980. In 1975-79, annual additions to debt would average \$8.9 billion. The rise in debt would far outpace growth in the value of farm assets, so that the debt/asset ratio would rise to 33 per cent by 1980.

In comparison with the experience of recent years, these projected credit demands represent somewhat slower rates of expansion in debt. However, no model represents continuation of the combination of capital growth that has actually prevailed in 1963-68—significant real additions to machine stocks *plus* relatively rapid increases in land values. If this experience were to continue through all the years to 1980, credit demands would probably prove larger than any of those projected. But the historical perspective on capital flows provided in Section III indicates this to be a somewhat extreme expectation.

Sizable increases in debt and in the debt/asset ratio are projected by each model. The levels reached in each by 1980 are not so large as to be impossible, but neither can the process continue indefinitely, especially at the rate represented by Model HM. At some point, capital flows may recede and/or

farmers' savings may increase. Or nonfarmers may supply significantly more of the capital needed. A watch should be maintained for the occurrence of such structural changes on a significant scale, as these events would lead to changes in demands for credit.

V. SOURCES OF CREDIT, 1950–79

From 1950 through 1968, \$41.3 billion of additional credit was supplied to farmers by a great many individual and institutional lenders. As will be shown, the share supplied by some lender groups increased over this period, whereas other groups became less important sources. Commercial banks, however, maintained about the same relative role over the entire period.

In the preceding section, further sizable increases in total farm debt were projected for the 1970's. To continue to provide their recent historical share of such expansion, banks would have to continue to expand their farm lending substantially. The amount of increase necessary to achieve this target varies among models, as it depends on the projected size of total credit requirements and also on how much of the credit is incurred to support non-real-estate rather than real estate spending. These projections of required bank credit growth are made here for Models HT, B, and HM.

Attention then turns to the supply of funds at rural banks—to examine how banks have been able to increase farm lending rapidly since 1950 and whether they will be able to continue the pace. Future deposit growth is projected and then compared with the various projections of future farm loan demands, to provide an indication of the degree to which internal growth of rural banks is or is not likely to be adequate to meet farm credit demands arising in a

variety of possible future farm capital situations.

Sources of outstanding credit, 1950–68

Credit to farmers is provided by a large number of individuals, dealers, and institutions. Estimates of the amount outstanding from each of several classes of lenders are published annually by USDA. For the major institutional lenders, these estimates are based on lender reports submitted at least annually. Commercial banks hold the largest outstanding farm loan total among these reporting lenders. Other institutions in this group are insurance companies, the Farmers Home Administration, and the agencies (Federal land banks, Federal intermediate credit banks, and production credit associations) that comprise the cooperative credit system supervised by the Farm Credit Administration.

Many other lending institutions make small amounts of loans to farmers, but in general they do not report their volume of farm loans. In the USDA estimates of farm lending, such loans are grouped with credit provided by individuals.

Taken together, individuals, dealers, and these nonreporting institutions are the most important source of farm credit. Retiring farmers and other sellers of farms, in particular, provide large amounts of credit to the purchasers by taking mortgages or land contracts. Merchants, dealers, and individ-

uals such as farm landlords also supply large amounts of non-real-estate credit to finance purchases of production inputs, machinery, and livestock. In this group, national farm supply and machinery corporations have emerged as a major source of financing. In general, these creditors do not report their loan volume annually, and so USDA estimates of the debt they hold may contain relatively large errors. This is particularly true of recent yearly changes, as census surveys of farm debt made in 1960 and 1965 have permitted improved evaluation of the relative longer-term role of these lenders.

Holders of outstanding debt. Outstanding farm debt on January 1, 1969, totaled \$52.0 billion, up from \$23.6 billion at the start of the decade and \$10.7 billion in 1950 (Table 12). Individuals, dealers, and nonreporting institutions held about two-fifths of the outstanding debt throughout this period.

TABLE 12
OUTSTANDING FARM DEBT, 1950-69
By major lender groups excluding CCC

Lender group	1950	1955	1960	1965	1969
Billions of dollars					
Banks	3.0	4.1	6.5	9.7	13.6
Money market lenders	4.9	7.2	11.5	17.5	26.2
Cooperative credit system	1.4	1.9	3.8	6.1	10.1
Life insurance companies	1.2	2.1	2.8	4.3	5.8
Dealers and individuals (non-real-estate)*	2.3	3.2	4.9	7.1	10.3
Individuals (real estate)*	2.3	3.4	4.9	7.6	10.9
Farmers Home Administration .....	.5	.7	.8	1.3	1.3
Total	10.7	15.4	23.6	36.0	52.0
Per cent of total					
Banks	28	27	27	27	26
Money market lenders	46	46	49	49	50
Cooperative credit system	13	12	16	17	19
Life insurance companies	11	13	12	12	11
Dealers and individuals (non-real-estate)*	22	21	21	20	20
Individuals (real estate)*	22	22	21	21	21
Farmers Home Administration	5	5	4	4	3
Total	100	100	100	100	100
Per cent of bank and money market total					
Banks	38	37	36	36	34
Money market lenders	62	63	64	64	66
Total	100	100	100	100	100

* Includes other nonreporting lenders.

SOURCE.—*Agricultural Finance Review*, USDA, Apr. 1969, pp. 2, and 22 and 23, *The Balance Sheet of Agriculture, 1968*, USDA, Jan. 1969, pp. 13 and 15. Data are as of January 1 of each year.

Among the major lending institutions, commercial banks ranked first with \$13.6 billion in 1969, about one-fourth of the total farm debt. Outstanding loans at banks had also increased markedly from \$6.5 billion in 1960 and \$3.0 billion in 1950.

The cooperative credit system held nearly one-fifth of outstanding farm debt in 1969. Its volume of \$10.1 billion represented a rapid rise from \$3.8 billion in 1960 and \$1.4 billion in 1950. Life insurance companies held \$5.8 billion of farm mortgage loans in 1969, representing 11 per cent of total farm debt. Finally, the Farmers Home Administration held 3 per cent of the total debt.

Farm debt has been rising by about 9 per cent yearly since the mid-1950's (Table 13). During 1965-68, total debt rose at an

TABLE 13
AVERAGE ANNUAL GROWTH RATE OF
OUTSTANDING FARM DEBT, 1950-68
By major lender groups excluding CCC
In per cent

Lender group	1950-54	1955-59	1960-64	1965-68
Banks	6.8	9.3	8.4	8.9
Money market lenders	8.0	9.8	8.8	10.6
Cooperative credit system	6.4	14.6	10.0	13.5
Life insurance companies	11.8	6.6	8.7	7.7
Dealers and individuals (non-real-estate)*	6.6	8.7	7.9	9.8
Individuals (real estate)*	8.1	7.3	9.5	9.4
Farmers Home Administration	5.5	3.5	8.6	1.0
Total	7.6	8.9	8.8	9.6

* Includes other nonreporting lenders.

annual rate of 9.6 per cent, paced by annual gains of 13.5 per cent in outstanding debt held by the cooperative credit system and assisted by rapid expansion of farm loans at each of the other principal lenders. Expansion at banks averaged 8.9 per cent annually during 1965-68 and 8.4 per cent during 1960-64, in each case only slightly below the growth rate of total farm debt.

Sources of additions to debt. Another perspective on farm credit is provided by examination of the sources of net additions to outstanding debt, which are shown in

TABLE 14
SOURCES OF ADDITIONS TO FARM DEBT, 1950-69
 Excluding CCC

In billions of dollars unless otherwise indicated

Lender group	1950-54	1955-59	1960-64	1965-69*
	5-year total			
Banks	1.2	2.3	3.2	4.9
Money market lenders	2.3	4.3	6.0	10.9
Cooperative credit system .....	.5	1.9	2.3	5.0
Life insurance companies .....	.9	.8	1.5	1.8
Dealers and individuals (non-real-estate)† .....	.9	1.7	2.2	4.0
Individuals (real estate)†	1.1	1.4	2.8	4.1
Farmers Home Administration .....	.2	.1	.4	.1
Total	4.7	8.2	12.4	20.0
	Annual average			
Banks .....	.2	.5	.6	1.0
Money market lenders .....	.7	.9	1.2	2.2
Cooperative credit system .....	.1	.4	.5	1.0
Life insurance companies .....	.2	.2	.3	.4
Dealers and individuals (non-real-estate)† .....	.2	.3	.5	.8
Individuals (real estate)† .....	.2	.3	.6	.8
Farmers Home Administration .....	...	...	.1	...
Total .....	.9	1.6	2.5	4.0
	Per cent of total			
Banks	25	28	26	25
Money market lenders	48	52	48	54
Cooperative credit system	11	23	19	25
Life insurance companies	19	9	12	9
Dealers and individuals (non-real-estate)†	19	20	18	20
Individuals (real estate)†	24	18	22	21
Farmers Home Administration	3	2	3	...
Total	100	100	100	100
	Percentage of bank and money market total			
Banks	34	35	35	31
Money market lenders	66	65	65	69
Total	100	100	100	100

* Data shown for 1965-69 are actual values for 1965-68 multiplied by 1.25 to facilitate comparison with previous 5-year periods.

† Includes other nonreporting lenders.

Table 14 for 5-year intervals since 1950. In each 5-year period, dealers and individuals provided about two-fifths of the increase, while banks provided about one-fourth. The increase at the cooperative credit system was low in 1950-54, when real estate lending by the Federal land banks was restrained by appraisal methods that proved outmoded. More recently, the cooperative credit system has been supplying around 20 to 25 per cent of the additions to farm credit. In 1965-68, banks and the cooperative credit system each supplied 25 per cent of the total increase. After providing 19 per cent of the

gain in farm credit in 1950-54, the share of life insurance companies dropped to about 10 per cent in subsequent periods.

Relative role of banks, 1950-68

New insights into the relative role of various lenders, as well as a better basis for projection of future roles, may be secured by further aggregation of lenders into groups with key common characteristics. Thus, it is useful to group three lender classes—the cooperative credit system, life insurance companies, and the nonreporting creditors who supply non-real-estate credit—into one category called “money market lenders” because the supply and the real or opportunity cost of the credit provided by each is influenced by conditions in the national money market. The cooperative credit system obtains its funds by selling money market instruments. Such instruments also comprise a major alternative investment for funds of life insurance companies. And, the non-real-estate-lending volume of non-reporting creditors is dominated by national corporations that supply production inputs to farmers, and such concerns are likely to have obtained funds for these loans in the money market or by borrowing from money market banks. Local merchant credit remains in this category as separate data are not available, but the amount of this misclassification is relatively small.

After this consolidation, four groups of farm lenders remain: (1) the money market lenders, (2) individuals who hold real estate debt, (3) banks, and (4) the Farmers Home Administration.

Individual holders of real estate debt are sellers of farms who took mortgages or sold by land contract for tax reasons, in order to make the sale, to obtain a higher price, or to retain a continuing investment in their farm. Their volume of lending depends on

the strength of these considerations and on prices and activity in the farm real estate market.

Banks are set apart as a third major lender group because their farm lending is significantly affected by factors different from either the sellers of farms or the money market lenders. Loans for real estate purchases constitute only 15 per cent of banks' farm lending, and so land market considerations are less important in determining loan volume than in the case of sellers of farms. Also, the bulk of banks active in farm lending find it difficult to participate effectively in national money markets under present conditions and so are dependent on local sources of funds. Thus, whereas money market participants active in farm lending face a very elastic supply function, in that their demands on the money market constitute only a small portion of total national demands for funds, most rural banks face a relatively inelastic supply. In seeking to enhance the growth of their lending resources, they are limited both by legal ceilings on interest rates they can offer on deposits and by the over-all economic growth being achieved by their community. In the long run, therefore, constraints are thereby placed on growth of farm lending at most rural banks, given present institutional arrangements that exclude such banks from effective participation in the money market.

The Farmers Home Administration completes the four lender groups. In its direct farm lending program, this agency makes supervised loans to farmers unable to obtain credit from the other lenders. The outstanding volume of these loans failed to increase during the 1965-68 period and consequently declined to 3 per cent of total outstanding farm debt. In the projections that follow, it is assumed that the volume of farm lending by the Farmers Home Administra-

tion will remain unchanged over the next decade.

Share of outstanding debt. As outstanding farm debt rose from \$10.7 billion in 1950 to \$52.0 billion in 1969, the share consisting of real estate debt held by individuals fluctuated narrowly between 20 and 22 per cent of the total. The share held by banks declined slowly from 30 per cent in 1952 to 26 per cent in 1969. Conversely, the portion held by money market lenders rose from 46 per cent in 1950 to 50 per cent in 1969 (Table 12).

Of the total debt held only by banks and money market lenders, the share held by banks declined from 39 per cent in 1952 to 34 per cent by 1969. In eight of the years from 1950 to 1968, bank credit grew faster than credit from money market lenders, but on average the latter tended to expand more rapidly throughout the period. In the 4 years 1965-68, debt at banks rose by 8.9 per cent annually, whereas debt held by money market lenders grew at a rate of 10.6 per cent (Table 13).

Share of additions to debt. While the share of outstanding debt held by banks eroded slowly over the entire period since 1950, banks' share of additions to farm credit showed no downward trend during 1950-64. Although year-to-year fluctuations were large, banks on average provided slightly over one-fourth of the total increase in farm credit and slightly over one-third of the total gain at banks and money market lenders. These shares of new credit were slightly below the shares of outstanding credit with which banks entered the period. This difference explains the erosion observed in the shares of outstanding credit.

In 1965-68, banks' share of additions to credit dropped to 25 per cent of the grand total and to 31 per cent of the sum provided by banks and money market lenders. The

share provided by money market lenders increased (Table 14).

Projected credit expansion by major lenders, 1970-79

The preceding section presented three alternative projections of increases in farm debt to 1980, based on three different capital models and a single farm income and savings rate projection. Given these projected additions to total farm credit, estimates are here made of the corresponding increases in farm lending by banks that would be necessary for banks to maintain their recent share—about one-third—of the total credit expansion projected for banks and money market lenders together.

Credit from sellers of farms. As a preliminary step, it is necessary to estimate the amount of additional real estate credit that may be provided by individuals, particularly sellers of farms. Credit from this source is virtually certain to be related to the value of farms transferred by sale; thus more would be expected if land prices rise rapidly, as projected by Model HT, than if they rise more moderately, as projected by Models B and HM. In addition, credit provided by sellers has recently been increasing relative to the value of transfers. It is estimated that such credit may have equaled 18 per cent of the value of real estate sales in 1955, 22 per cent in 1960, 24 per cent

in 1965, and 29 per cent in 1968. Several factors have contributed to this increase, chief among them being substantial capital gains tax advantages to sellers who provide credit under a land contract and the ability of sellers to offer lower downpayments than most institutional lenders. Again, the future trend of this ratio seems likely to be positively related to the rate of gain in real estate values.

With these considerations in mind, past increases in real estate credit provided by individuals were related to estimated capital flows required by real estate transfers. This ratio was estimated at 11 per cent in 1955-59, 17 per cent in 1960-64, and 20 per cent in 1965-67. For Models B and HM, the ratio was projected to average 22 per cent in 1970-74 and 24 per cent in 1975-79. For Model HT, in view of its more rapid rise in land prices, the ratio was projected at 25 and 29 per cent, respectively. These relationships were applied to the value of real estate capital flows projected by these models (Table 7) to obtain the estimated amounts of additional real estate credit that may be supplied by individuals and other nonreporting lenders. The estimates are shown in Table 15.

Projected loan demands on banks. Subtraction of the projected seller-supplied credit from the total credit requirements shown in Table 15 (from Table 10) yields projections

TABLE 15
ALTERNATIVE PROJECTED FARM LOAN EXPANSION AT MAJOR LENDER GROUPS, 1970-79
In billions of dollars

Projection, and period	Total	Individuals (real estate)	Banks and money market lenders	At banks to maintain relative share	Total	Individuals (real estate)	Banks and money market lenders	At banks to maintain relative share
Model HT								
1970-74	22.9	7.0	15.9	5.4	4.6	1.4	3.2	1.1
1975-79	29.3	11.0	18.3	6.3	5.9	2.2	3.7	1.3
Model B								
1970-74	18.5	5.5	13.0	4.4	3.7	1.1	2.6	.9
1975-79	17.0	6.7	10.3	3.5	3.4	1.3	2.1	.7
Model HM								
1970-74	34.4	5.6	28.8	9.8	6.9	1.1	5.8	2.0
1975-79	44.5	7.0	37.5	12.8	8.9	1.4	7.5	2.6

of the amounts to be supplied by banks and money market lenders together. If banks are to supply one-third of the latter totals, they would have to increase their farm loans by the amounts shown in Table 15.

In Table 16, the required additions to farm lending by banks are shown in a more familiar context, as the sum that outstanding farm loans would reach in 1975 and 1980 and as the average annual rate of increase in outstanding loans in each 5-year interval. Outstanding loan volume required in 1980 ranges from \$22.5 billion (Model B) to \$37.9 billion (Model HM). These sums may be compared with estimated outstanding volume of \$14.6 billion at the end of 1969. The projections show that credit demands on banks would be very large if the high rate of machinery investment projected by Model HM should materialize. Rapidly rising land prices, as represented by Model HT, would have a more moderate effect on credit demands on banks, because the projected increase in seller-financing of real estate transfers meets a significant portion of credit demands arising from that source.

Under the moderately greater capital flows of Models B and HT, and given the projected internal financing, annual rates of farm loan expansion averaging 6 per cent would suffice to maintain the relative role of banks in farm lending during 1970-74.

This pace would be significantly below actual rates of farm loan expansion at banks since 1955. But with the much greater capital flows represented by Model HM, farm loans at banks have to expand at an annual rate of 10 per cent, or even faster than they have been growing since 1955.

Supply of funds at rural banks

Would it be easy or difficult for banks to expand farm lending at the various rates projected above and thereby to maintain their share of the farm credit market? At present, rural banks depend primarily on growth in their deposits, most of which originate locally, for expansion of their lending resources.

Farmers' deposits. To some extent, banks act as financial intermediaries among farmers. In the early 1950's, the outstanding loans to farmers represented about one-half of farmers' deposits, and at that time overall farm lending activity at banks could be viewed as being on average sustained completely from the deposits of farmers themselves. By 1960, however, the volume of farm loans was almost equal to that of deposits, and in 1968 it was 43 per cent larger (Table 17). It is evident that banks have been making farm loans from funds received from sources other than farmers alone.

TABLE 16

ALTERNATIVE PROJECTED FARM LOAN EXPANSION REQUIRED AT BANKS TO MAINTAIN BANKS' RELATIVE ROLE IN FARM LENDING, 1970-79

In billions of dollars unless indicated otherwise

Projection	Outstanding loans											
	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79
	Increase during period						End of period					
Actual	1.2	2.3	3.2	4.9*	...	...	4.1	6.5	9.7	14.6*	...	...
Model HT .....	...	...	...	...	5.4	6.3	...	...	...	...	20.0	26.3
B .....	...	...	...	...	4.4	3.5	...	...	...	...	19.0	22.5
HM .....	...	...	...	...	9.8	12.8	...	...	...	...	25.1	37.9
	Average annual increase						Annual growth rate during period (per cent)					
Actual .....	.2	.5	.6	1.0*	...	...	6.8	9.3	8.4	8.5*	...	...
Model HT .....	...	...	...	...	1.1	1.3	...	...	...	...	6.5	5.6
B .....	...	...	...	...	.9	.7	...	...	...	...	5.5	3.4
HM .....	...	...	...	...	2.0	2.6	...	...	...	...	10.5	8.6

* Estimate based on data shown in Tables 12 and 14.

TABLE 17
COMMERCIAL BANK FARM LOANS COMPARED
WITH FARMERS' DEPOSITS, 1950-69
 In billions of dollars unless otherwise indicated

Year	Bank loans to farmers	Demand and time deposits of farmers	Farmers' loans as percentage of farmers' deposits
1950.....	3.0	6.6	45
1955.....	4.1	7.2	57
1960.....	6.5	7.2	90
1965.....	9.7	7.7	126
1969.....	13.6	9.5	143

SOURCE.—*Agricultural Finance Review*, USDA, Apr. 1969, pp. 2, and 22 and 23. *The Balance Sheet of Agriculture, 1968*, USDA, Jan. 1969, pp. 10, 13, and 15.

The discussion of farmers' cash assets in Section III turned up conflicting views on the extent of the growth that banks can expect in farmers' deposits during the next decade. As farmers purchase more inputs, cash working capital has become more important in farm operation, but farmers have also learned how to economize on these balances. If these offsetting trends continue, farmers' demand deposits may show only moderate growth. It is possible, however, that banks could achieve more significant expansion in time deposits of farmers by attracting current and past savings away from alternative investments.

Total deposit growth, 1950-68. Fortunately, total deposits at rural banks increased at a faster pace than farmers' deposits alone. An indication of this is provided by the USDA's index of deposits of country banks, which measures changes in deposits at banks in towns with population under 15,000 in 20 agricultural States. These primarily rural banks achieved annual growth in total deposits averaging 3.4 per cent in the 1950's, 5.8 per cent in 1960-64, and 8.5 per cent in 1965-68 (Table 18).

The very significant recent acceleration in the growth of total deposits at these banks can be traced primarily to the expansion of time deposits. Since 1950, demand deposits have increased slowly, with annual expansion averaging less than 3 per cent. Time deposits, however, rose at an average annual

rate of about 10 per cent in the 1950's and 15 per cent in 1960-68. At first, these rapid rates of expansion did not contribute much to total deposit growth, because time deposits represented only a small fraction—13 per cent in 1950—of total deposits at these banks. But as the rapid pace continued, time deposits became more important, reaching 44 per cent of total deposits in January 1969. With this sizable component growing at 15 per cent annually, total deposits rose by 8.5 per cent a year in 1965-68 even though annual demand deposit growth averaged only 4.2 per cent during these years.

TABLE 18
DEPOSITS OF SELECTED COUNTRY BANKS,
1950-69*

Period	Total	Demand	Time
Index of volume (1947-49 = 100)			
1950.....	102	103	103
1955.....	124	122	152
1960.....	142	127	260
1965.....	188	144	502
1969.....	261	170	883
Average annual growth rate (per cent)			
1950-54.....	4.0	3.4	8.1
1955-59.....	2.7	.8	11.3
1960-64.....	5.8	2.5	14.1
1965-68.....	8.5	4.2	15.2

* Data are for banks in towns with population under 15,000 in 20 agricultural States, as compiled and published by USDA. Data for 1950-65 are averages for January of each year. Data for 1969 are as of January 1.

SOURCE.—Agricultural Finance Branch, USDA.

Deposit and farm loan growth compared, 1950-68. Data on farm loan growth at the universe of banks used in compiling the USDA index of country bank deposits are not available. It is likely, however, that they parallel the course of farm loans at all banks and that impressions obtained from a comparison of the deposit index with total farm loan growth will not be misleading. Such comparison shows that farm loans have tended to increase faster than rural bank deposits (Table 19). The gap was especially large in 1955-59, was reduced somewhat by faster deposit growth in 1960-64, and then almost closed by still faster deposit growth in 1965-68. In 1965-68

TABLE 19
COMPARISON OF DEPOSIT AND FARM LOAN
GROWTH, 1950-68

Average annual rate of growth, per cent		
Period	Total deposits of selected country banks	Total farm loans at all banks
1950-54.....	4.0	6.8
1955-59.....	2.7	9.2
1960-64.....	5.8	8.4
1965-68.....	8.5	8.9

deposits rose by 8.5 per cent annually while farm loans expanded at a rate of 8.9 per cent.

Confirmation of these recent relationships between loans and deposits is afforded by data from surveys of banks active in agricultural lending, made annually since 1962 by The American Bankers Association (ABA). From 1962 to 1965, loan/deposit ratios at these banks tended to move upward. In 1968, however, the distribution of banks by loan/deposit ratio was still much the same as in 1965 (Table 20). At the na-

TABLE 20
PERCENTAGE DISTRIBUTION OF ABA
AGRICULTURAL BANKS, MIDYEAR 1962-68
By loan/deposit ratio

Year	Loans as percentage of deposits		
	Under 50	50 to 59	60 and over
1962.....	41	34	25
1963.....	38	33	29
1964.....	31	35	34
1965.....	27	32	41
1966.....	27	31	42
1967.....	21	33	46
1968.....	25	33	42

NOTE.—Data are for banks designated as "agricultural" banks by The American Bankers Association and thereby covered by the midyear agricultural credit situation survey. Approximately two-thirds of all insured commercial banks qualify as agricultural banks under the criteria used. See footnote 39.

SOURCE.—*Trends in Agricultural Banking: Report of Midyear 1968 Agricultural Credit Situation Survey*, The American Bankers Association, New York, 1968, p. 8.

tional "median" bank covered by the ABA surveys, the 58 per cent gain in farm loans in 1963-68 was virtually identical to the 59 per cent increase in total deposits. At banks in the Plains States, however, deposits had risen by only 26 per cent compared to farm loan growth of 67 per cent.³⁴

³⁴ *Trends in Agricultural Banking: Report of Midyear 1968 Agricultural Credit Situation Survey* (New York: The American Bankers Association, 1968), p. 8.

Projected deposit growth, 1970-79. It seems reasonable to believe that demand deposit growth at rural banks in 1970-79 may resemble postwar expansion to date, averaging perhaps 3 per cent annually. This projection reflects the growing money needs of an expanding rural economy. However, the rate of money expansion is somewhat below the anticipated rate of economic growth, as persons and businesses continue to reduce the money balances that they hold in relation to their volume of transactions.

Projection of time deposit growth seems more speculative. To some extent, the large recent gains represent an adjustment by the public to increased attractiveness of time deposits relative to both demand deposits and nonbank investments. First, ceiling interest rates prescribed by regulatory authorities on passbook and other time deposits were raised to a level more competitive with those paid by nonbank financial intermediaries, such as savings and loan associations, and with returns available from U.S. savings bonds and marketable securities. Second, in response to their increased loan requests and reduced liquidity, many banks began to offer time certificates of deposit on which they were permitted to pay higher rates of interest than on passbook savings accounts. Small banks, while unable to participate in the sale of large-denomination certificates that have become a popular short-term investment for businesses with surplus cash, have been quite successful in marketing small-denomination certificates and passbook-notice accounts to the public.

From one point of view, further reallocation of personal savings to time deposits could occur, if time deposits continue to be attractive. Nationally, time deposits at banks still constitute a relatively small share of the total financial assets of consumers—in

1968, less than 10 per cent of the total. Thus, even relatively small shifts of funds from other assets into time deposits would enable the latter to increase at a very rapid rate, and this process conceivably could continue for many years.

However, there is a second and probably dominant consideration that militates against such expectations. The rate of time deposit growth is obviously an important influence on the rate at which total bank credit can expand—and expansion of total bank credit will continue to be greatly influenced by national economic policies seeking full employment without price inflation. Thus, policies of the Federal Reserve System can be expected to result in rates of bank credit expansion consistent with potential real economic growth, while taking into account trends toward greater relative use of credit. In this environment, total deposit growth at banks will at times be encouraged and at other times restrained, as appropriate in the light of national economic goals and current business conditions. The relative attractiveness of time deposit rates is likely to be regulated accordingly. On

average, an annual increase of 6.5 per cent in total deposits may represent a reasonable projection.

This reasoning implies that a slowdown from recent rates of time deposit growth must be projected, with the estimated future gains dependent on the growth actually experienced in demand deposits. If the latter do increase at an average rate of 3 per cent annually at rural banks covered by the USDA index, the following annual rates of time deposit growth at these banks would yield the projected 6.5 per cent increase in total deposits in the 1970's: 11 per cent in 1969, 10 per cent between 1970 and 1974, and 9 per cent between 1975 and 1979.

Projected deposit and farm loan growth compared, 1970-79. If farm credit demands on banks were to increase at the same rate as deposits, it may be assumed that on average banks would be able to meet these demands without excessive difficulty; that is, on the average, banks could increase farm loans at this rate without (1) increasing the proportion of farm loans in their loan portfolios, or (2) increasing their over-all loan/deposit ratio in order to make the additional farm loans. Farm loan expansion at a

TABLE 21

PROJECTED FARM LOAN EXPANSION AT BANKS COMPARED WITH BANKS' INTERNAL RESOURCE GROWTH, 1970-79

In billions of dollars unless otherwise indicated

Projection, and period	Increase in outstanding loans						Banks' percentage share of total farm loan expansion if bank expansion is—	
	Needed to maintain banks' relative role in farm lending	Supported by annual deposit growth of 6.5 per cent	Excess of needed amount over expansion supported by internal growth	Needed to maintain banks' relative role in farm lending	Supported by annual deposit growth of 6.5 per cent	Excess of needed amount over expansion supported by internal growth	Enough to maintain relative role	6.5 per cent annually
Model HT								
1970-74...	5.4	5.4	.1	1.1	1.1	...	24	23
1975-79...	6.3	7.3	-1.1	1.3	1.5	.2	21	25
Model B								
1970-74...	4.4	5.4	-.9	.9	1.1	-.2	24	29
1975-79...	3.5	7.3	-3.8	.7	1.5	-.8	21	43
Model HM								
1970-74...	9.8	5.4	4.5	2.0	1.1	.9	29	16
1975-79...	12.8	7.3	5.5	2.6	1.5	1.1	29	16

yearly rate of 6.5 per cent during the 1970's would increase outstanding farm loans at banks by about \$5.4 billion in 1970-74 and \$7.3 billion in 1975-79. Table 21 shows how these amounts compare with expansion that would have to take place under the various capital models in order that banks maintain their relative share of farm lending.

In only one of the model situations would this rate of increase in farm credit availability at banks exceed the credit demand projected. This result occurs in Model B, which combined a stable real stock of farm machinery with a moderate 3 per cent yearly increase in land prices.

In the other situations projected, in which one of these capital projections is different—either real machinery stocks increase (Model HM) or land prices rise faster (Model HT)—expansion of deposits and loans at 6.5 per cent yearly would at best just permit banks to maintain their one-third share of total bank and money market lending (Model HT) or funds would fall substantially short of this goal (Model

HM). As these capital trends may easily continue, the projections on balance point toward probable difficulty for banks as they try to meet the farm loan demands of their present customers. If, as in Model HT, projected national supply and demand for bank credit are roughly in balance, a significant proportion of banks can still be expected to be out of balance because of differing local conditions. In the situation projected by Model HM, a majority of rural banks would experience farm lending difficulty.

On balance, the analysis and projections indicate a fairly high probability that rural banks may be unable to maintain their usual share of farm lending on the basis of growth in their deposits. True, low farm capital requirements would reduce credit demands to a rate that could be met by probable deposit growth. Or a continued very high rate of increase in time deposits would enable higher credit demands to be met. But more probable events appear likely to result in a shortage of internally originated loanable funds relative to farm credit demands on rural banks.

VI. SEASONAL PRODUCTION CREDIT

In addition to using credit to maintain, add to, and transfer capital assets, farmers demand seasonal credit to carry on production processes not financed from their stock of cash and liquid assets. Seasonal credit extensions particularly require recognition here because the preceding analysis employed capital stocks and debt measured as of January 1, whereas the national seasonal peak in the demand for farm working capital occurs in the spring and summer.

Unfortunately, seasonality of total expenses and working capital has not been measured. Only annual estimates of farm expenditures and capital are available.

Data on seasonal credit extensions are also incomplete. Such credit is provided mainly by three lender groups: merchants and dealers, commercial banks, and production credit associations (PCA's). Advances and outstanding debt at PCA's are reported monthly, but PCA's hold only about one-sixth of total non-real-estate debt. Loans from commercial banks, which represent two-fifths of the total, have been reported only semiannually in recent years. Debt outstanding at merchants, dealers, and other individuals is estimated only as of January 1.

Although the magnitude of seasonal capital and credit requirements is not known,

the rate at which such demands have been expanding can be estimated with the help of some plausible assumptions. For instance, the growth rate of operating expenses that clearly have a significant seasonal component can be computed. If the relative seasonality of these expenses is assumed to have remained roughly unchanged, that growth rate becomes an estimate of the rate at which seasonal capital requirements have been rising.

On the credit extension side of the puzzle, the January–July variation in loans outstanding at PCA's and banks, after adjustment for trend, can serve as an index of seasonal credit extensions by these lenders. The assumption here is that a change in the amount of seasonal lending would change the difference between January and July outstanding loans by about the same proportion. Thus, the growth rate of that difference becomes an estimate of the growth rate of total seasonal lending by these institutions. The validity of this estimate may be helped by the fact that January is the low month and July the high month in outstanding farm debt nationally, as indicated by data for PCA's.

Seasonal capital requirements

Operating expenditures with major seasonal elements include purchases of seed, fertilizer, and lime; operation and repair of motor vehicles and machinery; and wages and perquisites paid to hired workers who do not reside on the farm by which they are employed. These expenses are tabulated in Table 22. Purchases of feed and livestock are omitted from this table both because additions to these inventories have been included in capital requirements previously considered and because the national seasonal peak in credit extended for these items likely occurs near the January 1 date on

TABLE 22

SELECTED CURRENT FARM OPERATING EXPENSES
In per cent unless otherwise indicated

Item and period	Total	Seed purchases	Fertilizer and lime	Operation and repair of vehicles and machinery	Wages to non-resident workers
Expenditures in 1968 (millions of dollars)	8,788	668	2,095	3,916	2,109
Increase from 1956–58 to 1966–68:					
Total	38.2	28.3	74.2	19.8	53.3
Annual rate	3.3	2.5	5.7	1.8	4.4
Average annual rate of change in specified period:					
1950–54	3.2	–.7	6.2	4.1	.1
1955–59	3.4	–1.4	1.3	3.7	6.6
1960–64	2.2	2.9	5.7	–.3	4.0
1965–68	4.6	4.2	5.3	4.5	4.0

SOURCE.—*Farm Income Situation*, USDA, July 1969, pp. 56, 58, and 59.

which capital stocks and debt were measured for the preceding analysis. Repairs and maintenance of buildings and land improvements are omitted on the conjecture that they did not have a strong seasonal element. For the same reason, wages paid to hired workers who reside on the farm are also excluded.

The selected expenses totaled \$8.8 billion in 1968 and over the previous decade had risen at an average annual rate of about 3.3 per cent. An exponential least-squares trend for 1950–68 rises by 3.1 per cent yearly. Data for each component, as shown in Table 22, reveal that these longer-term averages are depressed by the relative stability in vehicle and machinery expenses during the early 1960's. With such expenses advancing more rapidly in the last few years, the total selected costs rose by 4.6 per cent annually during 1965–68.

If the degree of seasonality in these expenditures has not changed in recent years, the seasonal capital requirement that underlies demand for seasonal production credit has also been advancing at these rates—less than half as fast as total outstanding farm debt. However, seasonal credit demands

may also have increased because farmers wanted to finance a higher proportion of their seasonal costs by borrowing. Further evidence is provided by examination of the seasonality in non-real-estate debt.

Seasonal credit extensions

Semiannual variation in outstanding non-real-estate farm debt held by reporting lending institutions was calculated by averaging the amounts outstanding at the beginning and end of each year and subtracting this average from the amount outstanding on July 1, with results as shown in Table 23. The seasonal credit increase thus obtained has an upward trend both in total and at banks and PCA's separately; however, the year-to-year fluctuations have been so large that the trend is not properly revealed by use of the 5-year periods that this study has employed in analysis of other data. Exponential trend curves fitted by the least-squares technique to data for 1950-68 were

TABLE 23

SEMIANNUAL VARIATION IN INSTITUTIONAL NON-REAL-ESTATE DEBT OWED BY FARMERS, 1949-68

Year	Debt on July 1 exceeded average of debt at beginning and end of year by—					
	Millions of dollars			Per cent		
	Total ¹	Bank	PCA	Total	Bank	PCA
1949....	437	271	146	11.6	13.6	38.7
1950....	269	127	108	8.7	5.6	25.8
1951....	464	247	171	12.5	8.8	33.8
1952....	680	418	211	16.4	13.2	36.4
1953....	634	400	191	15.9	13.4	33.5
1954....	609	354	171	15.8	12.4	30.5
1955....	664	385	185	15.8	12.3	30.3
1956....	640	363	183	14.4	11.0	27.2
1957....	473	222	161	10.0	6.4	20.3
1958....	530	255	178	9.9	6.6	17.8
1959....	686	336	262	11.0	7.5	21.2
1960....	650	329	241	9.5	6.7	17.0
1961....	626	311	244	8.6	6.0	15.6
1962....	627	278	243	7.8	4.9	14.0
1963....	872	425	313	9.7	6.7	15.9
1964....	956	500	324	9.8	7.3	14.8
1965....	781	326	299	7.4	4.4	12.3
1966....	855	385	324	7.3	4.8	11.6
1967....	940	433	356	7.2	4.9	10.9
1968....	1,030	485	393	7.3	5.1	10.7

¹ Total non-real-estate loans to farmers held by all operating banks, production credit associations, Federal intermediate credit banks, and the Farmers Home Administration, excluding loans guaranteed by the CCC.

SOURCE.—*Agricultural Finance Review*, USDA, Oct. 1957, pp. 30 and 31; Apr. 1969, pp. 22 and 23.

found more useful in showing average annual growth rates, along with the longer-term changes presented in the last section of Table 24.

TABLE 24

SELECTED CURRENT EXPENSES AND SEASONAL COMPONENT OF DEBT: AMOUNT AND RELATIVE CHANGE, 1950-68

In per cent unless otherwise indicated

Period	Selected current expenses	Seasonal component of institutional non-real-estate debt		
		Total	Bank	PCA
Annual average (millions of dollars)				
1950-54....	5,332	531	309	170
1955-59....	6,182	599	312	194
1960-64....	6,998	746	369	273
1965-68....	8,328	902	407	343
Change from previous period				
1950-54....	...	...	...	...
1955-59....	15.9	12.8	1.0	14.1
1960-64....	13.2	12.5	18.3	40.7
1965-68....	19.0	20.9	10.3	25.6
Change from specified period to 1965-68				
1950-54....	56.2	69.9	31.7	101.8
1955-59....	34.7	50.6	30.4	76.8
1960-64....	19.0	20.9	10.3	25.6

The estimated seasonal component of total institutional non-real-estate debt reached \$1,030 million in 1968 and exhibited an average annual growth of 4.4 per cent over 1950-68. The upward trend thus exceeded the annual average growth of 3.1 per cent estimated for seasonal production expenses. The excess may be explained by a seasonal element in intermediate-term credit that has been captured in the calculated seasonal component of debt—farmers tend to buy machinery in the spring, and debt incurred for this purpose would be paid down somewhat by year-end. However, farmers may also have been increasing the proportion of their seasonal production expenses financed by debt.

The increase in the seasonal component of outstanding debt fell far short of keeping pace with the rise in total non-real-estate debt at institutional lenders. In the late 1950's debt in July was about 10 per cent higher than the January-December average,

but by the late 1960's the average difference was reduced to 7 per cent.

Given the expectation that farm production will continue to rise at the modest rates that primarily reflect domestic population growth and higher consumer living levels, seasonal farm operating costs can reasonably be expected to continue to increase at rates approximating those of the recent past, in which the same influences were dominant. The historical record indicates that seasonal credit demands can be expected to reflect this increase, and thus to rise by perhaps 3 to 5 per cent annually. At this rate, the trend-adjusted January–July increase in non-real-estate farm debt might range from \$1.3 billion to \$1.7 billion around 1980. But if total non-real-estate debt should meanwhile increase in line with projections for total farm debt, this seasonal fluctuation would represent only about 4 to 5 per cent of outstandings.

This analysis and projection indicates that provision of quantities of seasonal credit desired by farmers as a whole will not be a major or growing problem. However, this prognosis is not likely to apply to each farming region. As will be shown, there is great regional variation in relative seasonal farm credit demands, and in some regions the seasonal factor can only be classified as huge. In these areas, any shortfall in total credit supply is synonymous with a shortage of seasonal credit. Also, changes in regional production patterns—particularly increasing specialization in a seasonal commodity—will continue to place at least temporary strains on seasonal credit resources in some areas from time to time.

Institutional sources of seasonal credit

As estimated seasonal lending at banks and PCA's together has recently been rising somewhat faster than estimated seasonal

capital requirements, one might reason that these institutional lenders have been responsive to farmers' seasonal demands. However, the increased credit demands have been met more vigorously by PCA's than banks. The large year-to-year fluctuations in the calculated seasonal component, particularly in the bank debt series, precludes explicit judgments, but it appears that during the last two decades PCA's may have provided additional seasonal credit that surpassed the volume supplied by banks, in spite of the PCA's lesser role in total non-real-estate lending (Table 24). The 1950–68 least-squares trend shows that the seasonal component of non-real-estate loans at banks rose at an average annual rate of only 3.0 per cent, whereas that at PCA's rose by 5.5 per cent annually.

At both PCA's and banks, seasonal credit extensions have become a substantially smaller proportion of outstanding credit. The semiannual variation at PCA's fell from 18 per cent of outstanding loans in 1958 to 11 per cent in 1968, while at banks it decreased from 7 per cent to 5 per cent (Table 23). As already noted, however, the amount of seasonal funds provided by both lenders actually increased and the seasonal role of PCA's rose in relation to that of banks. The ratios give the wrong impression because total farm lending (1) increased greatly at both lenders and (2) grew faster at PCA's than at banks.

PCA credit exhibits greater seasonality than bank non-real-estate credit in all major production areas except the Appalachian and Southeastern States (Table 25). The same relationship is found in many important farm States—in 1968, PCA's showed larger relative seasonal variation in 18 of the 29 States in which bank non-real-estate farm loans exceeded \$100 million, while in 1966 the proportion was 20 of 28 States.

TABLE 25
SEMIANNUAL VARIATION IN BANK AND
PCA NON-REAL-ESTATE DEBT
OWED BY FARMERS, 1968
By farm production areas

Area	Debt on July 1 exceeded average of debt at beginning and end of year by—			
	Per cent		Millions of dollars	
	Bank	PCA	Bank	PCA
United States	5.1	10.7	485	393
Northeast .....	.8	-1.5	3	4
Lake States	4.3	4.9	37	20
Corn Belt	1.4	7.0	35	51
Northern Plains	-.3	3.3	4	13
Appalachian	14.6	9.3	66	39
Southeast	9.9	6.0	29	20
Delta States	26.3	53.8	74	117
Southern Plains	4.1	13.4	40	40
Mountain	6.4	13.7	65	50
Pacific	12.8	16.3	140	40

SOURCE.—*Agricultural Finance Review*, USDA, Apr. 1969, pp. 24 and 25.

Seasonality in farm loans is greatest in Southern, Plains, and Western States. In the Mississippi River Delta States, for example, the semiannual variation in 1968 was 26 per cent of outstanding loans at banks and 54 per cent at PCA's.

These regional data indicate the continued great importance of seasonal credit in some farming areas. From the historical trends previously noted, it appears that PCA's have been better able than banks to meet seasonal credit demands in areas where such demands have been large and increasing.

Part 2. PROPOSALS TO INCREASE AVAILABILITY OF BANK CREDIT

Part 1 outlined two important projections: (1) the agricultural sector is likely to continue to seek significantly larger amounts of credit, and (2) the ability of rural banks to provide their historical share of such increases and adequately finance their communities from their own resources is likely to be further impaired.

To maintain their role as a leading farm lender, commercial banks will therefore increasingly have to assume the role of intermediaries who channel nonlocal—urban and money market—capital into agricultural loans of either a term or a seasonal character. The avenues for securing such funds fall into two general categories: (1) discount or sale of assets—in particular, of loans; and (2) borrowing, such as by purchase of Federal funds or sale of time certificates of deposit.

These avenues for obtaining reserves to support additional lending have been partly or totally closed to many banks that are extensively engaged in rural lending. Whereas secondary markets have been developed for some bank paper, such as acceptances and mortgages, there is virtually no market for many rural loans. Thus, most banks that make a high percentage of their loans to agriculture and for other rural purposes are unable to obtain any significant volume of reserves through rediscount or sale of notes. Their volume of lending is reduced by this imperfection in financial markets.

Borrowing—the second route by which additional reserves can be secured—has been employed in significant proportions by large banks but is much less available to small institutions. Present markets in such instruments as Federal funds, time certificates of deposit, and Euro-dollars are largely designed to meet efficiently the needs of large banks. Thus small banks, including most banks engaged primarily in rural lending, are in many cases virtually precluded from participation or can participate only as effectively as the interest of their city correspondent permits. The ability of small or isolated banks to employ these sources of funds is further restricted by lack of managerial skills in this area, lack or relatively high cost of market information, and the relative lack of geographical and economic diversification of their resources, which outside investors tend to view as prima-facie evidence of higher risk.

These imperfections in financial markets prevent an optimum allocation of money market resources, with attendant social cost. Economic sectors that must deal with the disadvantaged banks—industries such as agriculture, with large numbers of small firms located in isolated areas—are placed at a relative disadvantage in obtaining funds to finance expansion, new technology, or seasonal production processes.

In the next three sections, imperfections in specific banking mechanisms and financial markets are considered in somewhat

greater detail to determine whether the flow of funds into rural areas is obstructed. Some thoughts are offered on how procedures might be changed or new mechanisms established to improve the mobility of funds and thereby to increase the potential lending ability of rural banks.

First, the efficacy of correspondent banking—the present mechanism by which funds are moved within the commercial banking system—is reviewed and appraised. Evidence from Federal Reserve studies is presented to question whether correspondent banking makes a net contribution to the flow of funds into rural areas, and to examine whether its contribution could be improved by altering the manner in which most correspondents are compensated for their services.

To complement the evaluation of correspondent banking, which is most highly developed in States with unit banking, the rural lending performance of branch banking is also examined. While the conversion of small rural banks into arms of larger institutions is shown to present important advantages, several offsetting conditions and circumstances are also noted.

The second question raised is whether

present central banking mechanisms—the open market and discount operations of the Federal Reserve System—succeed in providing an equitable proportion of reserves to rural sectors. An optimum distribution of reserves provided either for seasonal fluctuations or for long-term growth is thought unlikely given the present state of financial markets, with funds reaching small and isolated banks after considerable lag, if at all. Therefore, a number of suggestions for improving present markets or compensating for their deficiencies are offered.

Third, as a fundamental means for moving money market funds into rural lending via the banking system, development of secondary markets in rural bank portfolio items is proposed. Organizational considerations and operational methods are briefly outlined for new regional agencies—unified markets—that would make trading in such items feasible by neutralizing certain disadvantages that rural banks face in current money markets. Regional unified markets would provide rural banks with information and trading facilities for all financial instruments, and thereby place rural banks on a more nearly equal footing with other institutions in the financial arena of the Nation.

VII. CORRESPONDENT AND BRANCH BANKING

In the context of this study, correspondent and branch banking constitute existing mechanisms by which the advantages of large banks can potentially be enjoyed in rural areas. These mechanisms are inherently capable of improving the flow of funds, both between the money market and rural banks and among rural banks. In this process the net flow of funds can be either into or away from rural areas. Unfortunately, national evidence on the net effect is meager. Relevant considerations and

some recent research findings are discussed here.

One other aspect of correspondent and branch banking deserves special mention: among the mechanisms considered, these arrangements alone provide a means to cope with the problem of farm loans that exceed the legal lending limits of rural banks.

Correspondent banking

The correspondent-banking mechanism helps to provide more effective financial serv-

ices to rural areas. City banks may handle overline loans, provide seasonal credit, advise on investment policies, help with accounting and management problems, execute security transactions, and clear checks. In exchange for such services, country banks maintain deposits with their city correspondents. This traditional method of payment drains funds from rural areas by tending to offset, or in many cases exceed, funds provided through credit services.

Our interest in correspondent banking centers on the effectiveness and cost of the credit services rendered to rural areas. Insofar as available information and data permit, the following questions will be investigated: (1) Are the credit services responsive to rural needs? (2) What is the ratio between funds provided to and drawn from rural areas? (3) Should credit services be paid for by deposit balances?

Correspondent-credit services. Intensive interviews about correspondent relationships were conducted with a number of rural banks in 1966.³⁵ These banks regarded the handling of overline loans as the most important credit service rendered by their city correspondents, and nearly all were using or had used their correspondents in this way. In a few instances, a customer had been referred to a correspondent, and in some cases the banks had also obtained loans from the city banks. But on the whole, most of the credit was obtained in the form of participations in loans originated by the country bank, and most participations were sought because the loan exceeded the legal lending limit of the country bank.

Two earlier but broader surveys confirm this finding. A national survey of correspondent banking conducted in 1963 found that

³⁵ A total of 29 country bankers in Iowa, Illinois, Colorado, Kansas, and Oklahoma were interviewed by personnel of the Federal Reserve Banks of Chicago and Kansas City.

the bulk of correspondent credit was provided through participation loans.³⁶ In the 1963 midyear farm credit survey by The American Bankers Association, 84 per cent of country bankers and 74 per cent of city bankers rated participation in overline loans as the most important correspondent banking service to agriculture.³⁷

Participations are also used to obtain correspondent credit even when overlines are not involved. For example, one banker has described how his bank obtains seasonal credit through sale of participation certificates in a block of farm loans. This procedure was found more convenient than the sale of individual notes.³⁸

Extent of overline loan problem. Legal lending limits fix the maximum outstanding credit that a bank may extend to an individual and are intended to avoid serious financial difficulty should one borrower default. For national banks, the legal limit is 10 per cent of the bank's capital and surplus, except that loans secured by livestock may go to 25 per cent. Laws governing banks chartered by State governments generally also impose lending limits based on similar criteria, although they vary among States.

Rapid postwar growth in the size of individual farms has resulted in numerous farm loan requests that exceed the legal lending limit of the bank at which they are made. The market value of average assets per farm in the United States, for instance, more than doubled both in 1946-56 and

³⁶ U.S. Congress, House, Subcommittee on Domestic Finance of the Committee on Banking and Currency, *A Report on the Correspondent Banking System*, 88th Cong., 2d Sess., 1964, pp. 2-4.

³⁷ T. P. Axton, "Introductory Remarks," *Correspondent Agribanking: Proceedings of the Correspondent Agribanking Forum* (New York: The American Bankers Association, 1963), pp. 5 and 6.

³⁸ Robert L. Walton, "Overcoming Pressure of Seasonal Loan Demand," *Agricultural Banking and Finance* (Nov.-Dec. 1967), pp. 28-31.

1956–66. The average amount of credit used per farm more than tripled during each of these periods. The assets and capital of most rural banks did not grow so rapidly. Thus in many areas, a significant proportion of farms grew much faster than the banks by which they were being financed.

Therefore, overline loan requests persist even though lending limits of rural banks have been moving upward. Between 1962 and 1968, ABA surveys found that the proportion of agricultural banks with loan limits under \$50,000 declined from 43 to 23 per cent and the proportion with limits of \$150,000 and above increased from 25 to 37 per cent. However, the proportion of agricultural banks that received one or more overline requests in the first half of the year increased from about 25 per cent in 1962 to 29 per cent in 1968. In surveys made each year since 1962, this proportion has ranged between 26 and 34 per cent.³⁹

Overline loans are particularly common at rural banks in Western States that prohibit or severely restrict branch banking. Farms in these States tend to be large, and the rural banks tend to be small. In the 1968 ABA survey, 41 per cent of agricultural banks in the Plains States had received at least one excess farm loan application.

The Federal Reserve's 1966 survey of farm lending confirmed both the widespread occurrence and the geographical concentration of overline farm loan requests. Of all insured commercial banks, 14 per cent

had received at least one overline request during the 12 months ending in June 1966. Among banks with capital and surplus below \$300,000, one-fourth had received overline requests.

Nationally, there were about 12,000 requests totaling \$330 million. They equaled 0.3 per cent of the number and 3 per cent of the volume of all farm loans outstanding on the day of the survey. At the banks that received the requests, however, the overline requests equaled 1.9 per cent of the number and 15 per cent of the dollar volume of outstanding farm loans. In both relative volume and number, overline requests were about five times more important at small than at large banks.⁴⁰

In the Northern Plains States—Kansas, Nebraska, and the Dakotas—the dollar volume of overline requests received during the year totaled 7 per cent of farm loans outstanding on the survey date, compared with the national average of 3 per cent. Overline requests also occurred with above-average frequency in the Southern Plains and Mountain States.⁴¹

Responsiveness to rural credit needs. The ABA midyear survey of agricultural banks has consistently shown that a high percentage of overline requests has been handled through the correspondent system. In 1968, for instance, 86 per cent of the dollar volume of excess loan applications was handled on a participation basis with correspondent banks. Another 5 per cent was referred entirely to a correspondent, so that only 9 per cent was lost to other lenders. During 1962–68, the proportion of dollar value handled through the banking system has

³⁹ *Trends in Agricultural Banking: Report of Mid-year 1968 Agricultural Credit Situation Survey* (New York: The American Bankers Association, 1968), pp. 11–13, and similar publications for earlier years. The ABA defines agricultural banks as banks with under \$5 million in assets having 5 per cent or more of their assets outstanding in farm loans, and larger banks with 1 per cent or more of their assets in farm loans. In 1968, 840 of these banks participated in the sample survey.

⁴⁰ Emanuel Melichar, "Bank Financing of Agriculture," *Federal Reserve Bulletin* (June 1967), pp. 929 and 930.

⁴¹ *Ibid.*, p. 943.

ranged from 88 to 97 per cent, and has most generally been at 94 to 95 per cent.⁴²

The 1966 Federal Reserve survey did not ask about the disposition of overline requests, but did show a relationship between these requests and outstanding participation loans. Of the banks with overline requests during the year ending in June 1966, one-half had at least one participation loan outstanding on June 30. At banks that had overline requests, participation loans represented a tenth of the outstanding farm loan business, about double the proportion found at all banks. Participation loans were relatively most important in those areas—the Plains and Mountain States—where overline requests were most frequent.

The survey found \$574 million of farm participation loans outstanding on June 30, 1966, of which the participating banks' share was \$304 million. Participation activity was widespread, as 2,500 banks had originated at least one of these outstanding loans, and 1,100 banks were participating in them. Since a similar survey in 1956, the number of originating and participating banks had tripled, and the dollar volume of participation credit had increased by 607 per cent.⁴³

In general, the 29 rural bankers interviewed in 1966 were pleased with their correspondent relationships, which echoed attitudes generally expressed by bankers in the 1963 national survey of correspondent banking.⁴⁴ Several bankers indicated that

their correspondent had always responded favorably when asked to take overlines. However, there were indications that correspondent-credit services may suffer as city banks reach less liquid positions. Several rural bankers had been told to hold credit extensions requiring overline participations to a minimum. Further questioning revealed that the banks that were asked to restrict credit in 1966—a year of general credit tightness—had generally tended to use their correspondents extensively, whereas those reporting no restrictions had never asked their correspondent to take more in overlines or other loans than the amount of their demand balance with the correspondent.

The Federal Reserve's 1966 national survey of farm lending provided additional insights into the resource pressures on city banks that might adversely affect their credit services to country banks. An estimated 83 per cent of participation funds came from banks with loan/deposit ratios of 60 per cent or higher. Also, 27 per cent of these funds were extended by banks that reported difficulty in financing their own farm customers.⁴⁵

Cost of correspondent-credit services. City correspondent banks are usually "paid" for their correspondent services by having the use of demand deposits that rural banks keep with them. This flow of funds from country to city counters the flow of correspondent credit from city to country.

How do the two flows compare in volume? Some indication is provided by comparing farm loan participations and demand balances outstanding on June 30, 1966. Because only data on *farm* loan participations were obtained in this survey, this comparison must be restricted to banks whose lending business consists primarily of loans to farmers. Banks with more than one-half of

⁴² *Agricultural Banking Development, 1962-1967* (New York: The American Bankers Association, 1967), pp. 13 and 14.

⁴³ Melichar, *op. cit.*, p. 937. For another discussion of overlines and participations, see "Lending Limits of Commercial Banks," in Gene L. Swackhamer and Raymond J. Doll, *Financing Modern Agriculture: Banking's Problems and Challenges* (Federal Reserve Bank of Kansas City, 1969), pp. 40-53.

⁴⁴ U.S. Congress, House, Subcommittee on Domestic Finance of the Committee on Banking and Currency, *Correspondent Relations: A Survey of Banker Opinion*, 88th Cong., 2d Sess., 1964, pp. 6 and 7.

⁴⁵ Melichar, *op. cit.*, pp. 940 and 941.

their total loans in loans to farmers were chosen. The analysis also concentrates on member banks, thereby avoiding the complicating factor that nonmember banks hold balances in other banks to meet reserve requirements. (Table 26 provides data for both member and nonmember banks.)

At the 855 member banks meeting the farm loan criterion, farm participations averaged 22 per cent of demand balances with other banks, whereas at the 2,069 nonmember banks, the ratio was 16 per cent. Thus, the balances exceeded the credit received by more than four times, which agrees with other impressions that the net flow of funds is from the country to the city. For the heavily agricultural banks in this analysis, a reasonable allowance for nonfarm participations and for nonparticipation credit would still leave correspondent balances far ahead of correspondent credit.

A more detailed analysis of these data reveals wide variation in the ratio of participations to balances among individual banks, indicating that managerial inertia at country banks may be an important factor contributing to the unfavorable direction of the net fund flow.

If a country banker is operating at a low loan/deposit ratio, city banks can hardly be faulted for attempting to obtain relatively large balances from him even though they are not called upon for proportionately large credit services. A distribution of the heavily agricultural member banks by loan/deposit ratio is particularly revealing. Those banks with loan/deposit ratios under 50 per cent had outstanding participations averaging less than 10 per cent of the balances they held in correspondent banks. The ratio of participations to balances rose with higher loan/deposit ratios until it reached 97 per cent at banks with loan/deposit ratios of 70 per cent and over. These banks kept correspondent balances averaging only 5.4 per cent of their deposits, compared with an average of 7.3 per cent for all the member banks in this analysis. A similar though less marked relationship was found at nonmember banks.

It is evident that some banks can obtain a relatively high volume of correspondent credit relative to balances. A further breakdown of the data cited shows that the larger banks among those with high loan/deposit ratios had the higher ratio of participations

TABLE 26

COMPARISON OF FARM LOAN PARTICIPATIONS RECEIVED FROM AND DEPOSIT BALANCES HELD IN OTHER BANKS, JUNE 30, 1966

Capital and liquidity status of bank	Millions of dollars		Farm loan participations as percentage of—		Balances as percentage of—		Millions of dollars		Farm loan participations as percentage of—		Balances as percentage of—	
	Farm loan participations	Balances	Balances	Farm loans	Deposits	Farm loans	Farm loan participations	Balances	Balances	Farm loans	Deposits	Farm loans
	Member banks						Nonmember banks					
Total	58	262	22	4.6	7.3	21	91	574	16	4.7	10.7	30
Capital and surplus (thousands of dollars):												
Under 200	7	51	13	3.1	8.5	24	52	264	20	6.3	11.5	32
200-299	16	63	26	5.7	7.5	22	15	130	12	3.3	9.9	35
300-499	17	82	21	4.4	7.3	21	18	123	15	4.1	10.3	28
500 and over	18	66	27	4.8	6.4	18	6	58	10	3.0	10.7	29
Loan/deposit ratio (per cent):												
Under 30	2	20	8	5.9	11.5	72	1	31	4	3.9	15.2	89
30-39	1	36	3	1.1	7.9	33	1	80	1	.4	11.7	49
40-49	4	59	7	1.8	7.6	26	11	126	9	3.1	10.9	36
50-59	14	69	20	3.9	7.3	20	10	161	6	1.8	10.3	28
60-69	16	56	29	4.7	6.7	16	44	116	38	9.0	10.2	24
70 and over	21	22	97	10.4	5.4	11	23	61	38	7.4	10.3	19

NOTE.—Data shown are for banks at which farm loans comprised 50 per cent or more of total loans.

to balances (Table 27). Better managerial skills at larger banks may have played a part in this result, along with the greater power that larger banks presumably have to encourage their correspondents to provide more credit service.

TABLE 27

FARM LOAN PARTICIPATIONS RECEIVED AS PERCENTAGE OF DEPOSIT BALANCES HELD IN OTHER BANKS, JUNE 30, 1966

Loan/deposit ratio (per cent)	Capital and surplus (thousands of dollars)		
	Under 200	200 to 499	500 and over
Under 50	18	3	1
50-69	3	38	11
70 and over	32	73	146

NOTE.—Data shown are for member banks at which farm loans comprised 50 per cent or more of total loans.

To some extent, fund outflow from rural communities is accentuated by complementary deposit accounts that rural bankers keep with city banks that are not called upon for correspondent credit and that in many cases are rarely called upon for services of any kind. Each of the 29 rural banks in the 1966 survey, for instance, was maintaining accounts with from 2 to 12 city banks; however, in no case did a bank have more than three active accounts. Some of these banks did report that they were reducing their number of inactive accounts.

However, there is ample evidence that provision of correspondent credit is directly dependent upon maintenance of deposit balances and is related to the amount of such balances. For instance, one Illinois bank, in return for use of an anticipated \$300,000 of seasonal participation credit (maximum \$800,000), agreed to "keep with the correspondent an average of \$150,000 in excess deposits above and beyond that needed to break even on a normal correspondent relationship."⁴⁶ In a normal year, the city bank would apparently provide

\$300,000 for perhaps 6 months, on which it would receive interest "at ¼ per cent above the prime rate." In effect, the country bank gave the city bank a yearly average of \$150,000 interest-free in return for the privilege of borrowing \$300,000 at slightly above the prime rate for perhaps 6 months. On a yearly average basis, the city bank's average commitment of its own funds was zero. If it could invest the balances at the prime rate, its annual earnings from the arrangement were equal to the prime rate times \$300,000. Nevertheless, this country banker was pleased with this correspondent arrangement. With his bank fully invested, he found it necessary to pay this relatively high price for seasonal credit.

City bankers traditionally have viewed deposit balances as additional compensation for provision of participation credit. For example, one banker with a large farm participation business, whose bank was therefore presumably offering participations on terms competitive with other city banks, made this statement in 1963:⁴⁷

We will not accept an overline from a country bank unless we have a deposit relationship with that bank. We expect some correlation between the amount of deposit relationship and the amount of overline accommodation. . . . We want the country banker to participate substantially in any loan he asks us to carry.

Apparently, farm loans obtained through correspondents were not viewed as a sufficiently profitable investment, even though the country banks were incurring most of the cost of originating the loans and were sharing the risks involved. Another city banker has more recently affirmed this view:⁴⁸

⁴⁷ Morris F. Miller, "Our Bank's Agricultural Program," *Correspondent Agribanking* (New York: The American Bankers Association, 1963), p. 36.

⁴⁸ Robert E. Hamilton, "Farm Credit—It Should Be Supplied by Bankers, but Agriculture Must Compete for Funds on the Same Basis as Any Other Industry," *Mid-Continent Banker* (Nov. 1968), p. 49.

⁴⁶ Walton, *op. cit.*, p. 30.

Where lies the glamour for Mr. City Banker to send funds to Farmer Smith through his banker in western Illinois at the prime rate, with no deposit balance? If, on the other hand, the same funds can be placed locally at the same rate with 20% compensating balances and some good trust business in prospect, where would your stockholders expect the money to go?

Similar attitudes on the part of city banks are likely to become even more common as more city banks encounter tighter liquidity conditions, with inherent conflict between the loan demands of their own customers and the credit needs of their country correspondents. If the latter needs are met, it seems evident that the correspondent system will exact a considerable toll for this service.

A proposal to minimize drains on rural funds. Although the use of deposit balances to pay for correspondent services drains funds from rural areas, in a number of common circumstances this means of payment constitutes an efficient use of rural banking resources. For many nonmember banks, correspondent balances also serve to meet State reserve requirements, and thus the funds would be unavailable for lending anyway. Also, at banks with funds in excess of loan demands, no immediate diminution of lending capability results when balances are used to pay for overline participations and other services. Or if a city bank is content to be paid for seasonal credit extensions by balances received only in the rural bank's off-season, and the rural bank would not be fully invested at that time in any event, payment through balances may not adversely affect the local credit service of the rural bank.

These circumstances are present in many correspondent relationships and may help to explain why a majority of country bankers surveyed in 1963 expressed a preference for balances over fees as means of payment for correspondent services.⁴⁹ Also, it is natural

for these bankers to favor a traditional technique to which they are accustomed. But with the increasing shortage of loanable funds and with more sophisticated management, more country banks may question the use of correspondent balances to pay for overline or seasonal participations. In many instances, community needs might be better served if rural banks made additional local loans with the funds they now are using to maintain correspondent balances and used the returns on these loans to pay for correspondent services on a fee basis. Fees for credit accommodation should prove reasonable, as interest rates charged by city banks on participations and other farm loans should be high enough to make them a profitable investment in their own right.

If city correspondents are able to adapt to the changed liquidity position of rural banks, and at the same time maintain or expand credit services provided to rural areas, they will continue to constitute a useful farm credit mechanism. However, an inevitable conflict may arise as both country and city banks simultaneously approach less liquid positions. Thus at the same time that country banks are interested in reducing correspondent balances and increasing credit services, city banks probably have more interest in increasing balances and less interest in providing credit. Given these circumstances, it seems unlikely that the traditional correspondent banking system can become the means whereby substantially larger quantities of urban funds are channeled into agriculture.⁵⁰ However, correspondent banking could contribute materially to this flow if city banks prove interested in becoming

⁴⁹ U.S. Congress, House, *Correspondent Relations*, *op. cit.*, pp. 10-12.

⁵⁰ Further evidence and evaluation of credit flows through the correspondent-banking system have been provided by a Federal Reserve staff task force headed by Ernest Baughman and Dorothy Nichols, Federal Reserve Bank of Chicago. Some data and conclusions from this study are presented by Bernard Shull in *Report on Research Undertaken in Connection with a System Study*, vol. 1 of this series, pp. 60-62.

brokers for funds that country banks need to maintain their role in rural finance.

Branch banking

In the heart of the Nation's agricultural areas—the western Corn Belt, Plains, and eastern Rocky Mountain States—branch banking is prohibited or severely restricted. One-half of the banking system's farm loans are in this region. Farm loan demands in the area have increased rapidly as crop farm acreages have been enlarged and livestock production increased. In consequence, many agricultural banks have reached high loan/deposit ratios and some have expressed concern over their future capacity to finance agriculture. Also, large farming operations are common in this area, so that overline loan requests are frequently received. Continued availability of participation credit from larger correspondent banks is essential in this environment.

In contrast, the 1966 survey of farm lending found that overline requests and general farm financing present markedly smaller problems in rural areas served by large branch-banking systems. The most striking evidence was contained in reports from the Pacific States, where very large farms predominate. But because the banks there were also relatively large, overline requests were virtually nonexistent, and few banks thought that farm loan demands pressed unduly against their resources.

In addition to being less likely to receive farm loan requests exceeding their legal lending limit, large branch banks are potentially able to improve rural credit services in several other ways. Their greater lending volume can support employment of specialists in farming and farm lending. Their lending practices and terms can therefore stay abreast of modern developments. Over-all management of the bank's re-

sources is also likely to be better than that achieved by many small banks. A typical branch system is likely to operate at a higher loan/deposit ratio than the average of an equivalent group of unit banks, partly because its geographically diversified lending reduces the over-all risk. More loans can therefore be made from the same banking resources. Within a branch system, funds can be shifted to offices facing the greater loan demand. Consequently, in communities where credit needs are greatest loans may easily exceed deposits. Finally, the larger banks are more likely to be able to tap national money markets for additional funds.⁵¹

On the other hand, there are reasons to question whether branch banking can be relied upon to improve the flow of bank credit to agriculture. To be most effective, a system should cover an area sufficiently broad and diversified to include both capital surplus and deficit regions between which funds can be moved. With branching limited to statewide systems at best, it is doubtful that this condition is met in some agricultural States. A more meaningful contribution could be expected if branching were permitted over a larger economic area or were delineated by national or regional economic sectors rather than State lines.

A second major concern is that the management of branch systems, because of unfamiliarity with rural finance, may not implement the policies that would lead to the potential lending improvements cited above. In a branch system covering a diversified area, rural lending may be a less

⁵¹ As part of the over-all discount study, Federal Reserve staff studies of fund flows within branch-banking systems were undertaken by Verle Johnson, Harmon Haymes, and Margaret Beekel. A brief statement of the findings is presented by Bernard Shull, *op. cit.*, p. 62.

important activity than in a unit bank in a rural community. Top managers will properly allocate less of their time to this phase of their bank's business. Nevertheless, such a bank can perform an outstanding rural credit job if top management is interested in developing its rural business along with its other endeavors and employs capable technical staff to work in rural credits. But if such lending is neglected by a large branch system, many rural communities may be adversely affected. The potential

limitations should be recognized along with the advantages.

Finally, a realistic appraisal must note that State legislation now prohibiting branch banking seems likely to be changed quite slowly, if at all. While a gradual nationwide trend toward reduction of restrictions can be detected, it has made little or no progress in many nonmetropolitan States. Meanwhile, it may prove desirable to implement other measures to improve the ability of the banking system to finance agriculture.

VIII. FEDERAL RESERVE CREDIT

Since the early 1930's, the Federal Reserve System has relied mainly on open market operations to provide reserves to support a growing volume of money and bank credit, as well as to offset seasonal and other fluctuations affecting bank reserves. Recently, only about 2 per cent on average of total Reserve Bank credit has been supplied through the discount window.

Making Reserve Bank credit available through open market operations and letting market forces determine its allocation has much appeal, should distributive mechanisms in the financial markets enable a near-optimum allocation to be achieved. Imperfection in present mechanisms, however, may lead to less-than-optimum distribution of new reserves among different economic and geographic sectors or may cause long lags before an optimum allocation is attained. Empirical evidence tends to verify these fears.⁵²

⁵² After empirical work that included comparisons of portfolio behavior at reserve city and country banks, Goldfeld concluded that in operations providing for reserve growth, "There is . . . no assurance that reserves generated by open-market purchases will find their way to banks in need of funds . . . open-market operations are likely to affect country banks only indirectly" (p. 52). Similarly, in operations off-

To compensate for inequities that thus arise from the present structure of banking and of financial markets, more Reserve Bank credit could be provided directly to rural banks. Through the discount mechanism, member banks in need of reserves have had access to credit for short periods of time—too short in most cases to provide effective support for farm lending.

Data on intrayear flows of loans and deposits show that many rural banks could each year use adjustment credit provided for the entire length of a farm production season. Such credit could be supplied through a discount mechanism redesigned to incorporate a seasonal borrowing privilege. The extent to which alternative types of such privileges might improve farm credit availability at banks is examined in this section.

The analysis also reveals that more than half of member banks in relatively tight

setting reserve losses, "there is no assurance that the reserves created by open-market purchases will be distributed among member banks in proportion to the reserve losses which they are intended to replace" (p. 183). Additional evidence is presented on pp. 149 and 150. See Stephan M. Goldfeld, *Commercial Bank Behavior and Economic Activity: A Structural Study of Monetary Policy in the Postwar United States* (Amsterdam: North-Holland Publishing Company, 1966).

liquidity positions face a year-round rather than seasonal strain on their lending resources. Furthermore, many rural banks are not members of the Federal Reserve System, and if they do not belong to the System, they would not be eligible for seasonal discount credit. Two possible Federal Reserve actions to assist both groups of banks are examined: (1) longer-term credit through the discount or open market mechanisms and (2) improvement of markets for assets and liabilities of rural banks.

Seasonal discount credit

Banks in nonmetropolitan areas frequently experience a seasonal squeeze on funds through simultaneous withdrawal of deposits and expansion of loan demands. Because of their small size and geographic isolation, rural banks frequently are ill equipped to utilize their resources effectively in a highly seasonal environment. During the off-peak season of the year, funds that might otherwise have been committed to financing intermediate-term rural needs instead tend to be maintained in short-term Government securities, city bank accounts, or other forms that provide a high degree of liquidity, but that represent inefficient use of the financial resources of the community. Twenty, or perhaps even 10, years ago, when most banks had ample stocks of liquid assets even at seasonal peaks, this situation caused little concern. Now, however, many banks are hard pressed to meet the loan demands of their area. With discount policy revised to allow rural banks to borrow a substantial portion of the funds required to meet seasonal outflows, these banks would have more funds for meeting community needs and would be able to handle their investment portfolios more satisfactorily.

The existing regulation permits extension of short-term discount credit for sea-

sonal requirements “. . . beyond those which can reasonably be met by use of the bank’s own resources.” This regulation has usually been interpreted to mean that a bank is expected to meet seasonal outflows of historically average amplitude through its own portfolio adjustments. And when borrowing for seasonal needs has been permitted, the assistance has usually been of shorter term than the period of the bank’s need. A helpful revision of the rule would permit Federal Reserve Banks to establish seasonal borrowing privileges for their member banks for meeting a portion of normal seasonal needs, with maturities geared to the length of need. This recommendation again seeks to remedy partially the inability of small and isolated rural banks to tap national money markets effectively for short- and intermediate-term funds. The following discussion demonstrates the scope of the seasonal lending problem at such banks and the extent to which assistance through the discount window might be helpful.

Example of seasonal fund flows at rural banks.

Not all rural banks experience seasonal loan demand and deposit withdrawals that are large in relation to the size of the bank. But at some banks, principally those in crop production areas, such fund outflows can be violent. To illustrate a situation of this kind, actual data for three small banks in Nebraska, each with large seasonal flows relative to its size, were averaged to obtain data for a composite rural bank (Table 28).

More than three-fourths of the loans at this bank consisted of loans to farmers, both in December and in June. But farm loans increased by 64 per cent between December 1965 and June 1966. In the same interval, deposits of individuals, partnerships, and corporations (IPC) decreased by 17 per cent. Even after adjustment for an

TABLE 28
SEASONAL FUND FLOWS AT A COMPOSITE
RURAL BANK ¹
Amounts in thousands of dollars

Bank's portfolio of —	Amount outstanding			Trend-adjusted January-June change as percentage of December total deposits
	June 1965	Dec. 1965	June 1966	
Farm loans	1,867	1,295	2,124	22
Total loans	2,414	1,664	2,485	25
Deposits, IPC	2,684	3,549	2,952	-23
Balances at other banks	324	555	398	-6
U.S. Govt. securities	687	1,847	611	-38
Loans as per cent of total deposits	77.8	40.4	74.9	...

¹ Average of data for three rural banks experiencing relatively large seasonal flows of funds.

upward growth trend in deposits and loans, the combined semiannual fund outflow from increases in all loans and withdrawal of IPC deposits was equal to 48 per cent of the December level of total deposits.

Other data in Table 28 indicate that as this bank received an inflow of deposits in the second half of the year, the money was placed primarily in U.S. Government securities and to a lesser extent was held as balances at other banks. In the spring, deposits flowed out of the community, and in addition farmers borrowed for production purposes. To accommodate these seasonal demands, the bank sold the securities that had been purchased the previous fall and also drew down its balances with other banks. The combined trend-adjusted semiannual change in these two assets totaled 44 per cent of total December deposits, almost equal to the relative semiannual outflow of 48 per cent.

This bank thus financed the seasonal demands of its community from its own resources; that is, from the resources of the community. Funds deposited in the fall were merely stored in anticipation of the certain outflow of the following spring. The bank had a loan/deposit ratio of 75 per cent in June, at which time its resources were almost fully employed. In December, however, its loan/deposit ratio was only 40 per cent.

Community consequences of large seasonal flows. The composite rural bank described above had nearly a maximum year-round level of loans consistent with meeting the indicated seasonal outflow from its own resources. If it had additional year-round loan demand, such as for farm machinery and equipment purchases or from nonfarm businesses, it could in theory operate in a different fashion and still meet the same seasonal outflow: it could commit its own funds to the additional year-round loans and borrow an equivalent sum during the spring and summer to meet the seasonal demand. However, with the present structure of money markets, this could be difficult for a small bank in Nebraska.

On the other hand, if this bank were able to obtain seasonal funds from its Reserve Bank in sufficient quantity to cover a significant portion of its seasonal outflow for the entire period of the outflow, it could operate in just that fashion. It could increase its year-round lending for legitimate community needs with complete assurance that funds would be available for the vital seasonal demands.

In addition, this bank, in spite of the large seasonal outflow, is possibly not meeting the full seasonal loan requirements of its customers. Faced with increasing demand for both year-round and seasonal credit, perhaps the latter is being curtailed instead of, or in addition to, the former. In this event, seasonal borrowing from the Federal Reserve Bank would enable the bank to meet more adequately the complete seasonal needs of the community. After several years the real seasonal pattern would be evident, and the bank could obtain still greater seasonal sums from the Federal Reserve, thereby releasing the community's own resources for additional year-round loans.

Community benefits from a seasonal discount privilege can thus be expected in situations where banks (1) are experiencing a significant seasonal outflow of funds relative to their size, and (2) are operating at a relatively loaned-up position at the peak of the seasonal outflow. The latter condition indicates that term and/or seasonal loan demands are not being fully met or that such a situation may soon develop. The following discussion attempts to measure the prevalence of these circumstances among rural member banks and to estimate the impact that seasonal discount arrangements might have on farm lending at these banks.

Prevalence of large relative seasonal outflows.

Fund flow data for all banks, similar to those shown for the composite rural bank, indicate that banks involved in financing agriculture to the extent of at least 25 per cent of their total loan volume (hereinafter referred to as agricultural banks) are more likely than other banks to have semiannual

cent of other banks had relative outflow of this magnitude. Also, an additional 32 per cent of agricultural banks had semiannual fund outflows of from 5 to 9 per cent of deposits, still a slightly higher proportion than found among other banks.

As of June 1966, agricultural banks comprised one-third of all member banks. But of member banks with relative semiannual outflow equal to 10 per cent or more of deposits, 55 per cent were agricultural banks. Of banks at which outflow comprised 5 to 9 per cent of deposits, 37 per cent were agricultural banks. Thus, relatively large seasonal fund outflows were more prevalent among agricultural banks—many of which were precisely the banks unable to cope with such seasonal flows except by keeping their own resources available for this use.

Potential impact of specific seasonal discount proposals. In any arrangement that permits banks to borrow from Federal Reserve Banks to meet part or all of seasonal outflows, specific rules would be needed to guide the definition and measurement of seasonal outflows, and to indicate the proportion of outflows that could be met by borrowing. Formulation and execution of such rules could, and undoubtedly would, employ more detailed banking data than the semiannual statistics shown thus far. The particular regulations adopted would influence the total amount of seasonal credit extended by the Federal Reserve System, as well as the amount that could be obtained by agricultural banks.

An indication of the proportion and amount of borrowing that might be done by agricultural banks, however, can be obtained from the semiannual data that is now readily available for all banks. Suppose, therefore, that seasonal outflow is defined as in the example involving the composite rural bank and that banks are allowed to

TABLE 29

DISTRIBUTION OF MEMBER BANKS BY RELATIVE SEMIANNUAL FUND OUTFLOW AND BY IMPORTANCE OF FARM LENDING, 1965-66

Relative semiannual fund outflow (per cent)	Total	Farm loans as percentage of total loans		
		Under 1	1 to 24	25 and over
		Number of banks		
All banks	6,151	1,388	2,713	2,050
Under 5	3,398	867	1,665	866
5 to 9	1,784	344	786	654
10 and over	969	177	262	530
		Percentage distribution (by relative outflow)		
All banks	100	100	100	100
Under 5	55	62	61	42
5 to 9	29	25	29	32
10 and over	16	13	10	26
		(by farm loan ratio)		
All banks	100	23	44	33
Under 5	100	26	49	25
5 to 9	100	19	44	37
10 and over	100	18	27	55

fund outflows. As Table 29 indicates, 26 per cent of agricultural banks experienced a semiannual fund outflow equal to at least one-tenth of deposit volume. Only 11 per

borrow funds equal to all outflow exceeding either 5 or 10 per cent of average deposits. The extent to which agricultural banks could participate in seasonal borrowing and the relationship between their potential borrowings and their volume of farm lending can be calculated to show the potential impact of the seasonal discount credit on farm lending. Selected data of this kind are shown in Table 30.

TABLE 30
ESTIMATED MAXIMUM SEASONAL BORROWING AT AGRICULTURAL AND OTHER BANKS UNDER ALTERNATIVE DISCOUNT PLANS, 1965-66

Seasonal discount plan (level of deductible)	Total	Farm loans as percentage of total loans		
		Under 1	1 to 24	25 and over
Number of banks eligible				
10 per cent	969	177	262	530
5 per cent	2,753	521	1,048	1,184
Distribution of banks eligible (per cent)				
10 per cent	100	18	27	55
5 per cent	100	19	38	43
Borrowings (millions of dollars)				
10 per cent	461	157	185	120
5 per cent	2,130	1,022	801	307
Distribution of borrowings (per cent)				
10 per cent	100	34	40	26
5 per cent	100	48	38	14
Borrowings as per cent of deposits at eligible banks				
10 per cent	4.1	3.0	4.8	5.5
5 per cent	3.0	2.6	3.1	5.3
Borrowings as per cent of farm loans at eligible banks				
10 per cent	59.4	...	97.0	20.5
5 per cent	87.3	...	82.4	21.9
Farm loans at eligible banks as per cent of farm loans at all insured banks				
10 per cent	7.0	...	4.0	9.9
5 per cent	22.3	...	20.1	23.8
Borrowings as per cent of farm loans at all insured banks				
10 per cent	4.2	...	3.8	2.0
5 per cent	19.5	...	16.6	5.2

Under the 10 per cent plan, 16 per cent of member banks could borrow, and 55 per cent of these would be agricultural banks. The 5 per cent plan would broaden potential borrowing to 45 per cent of mem-

ber banks, of which 43 per cent would still be agricultural banks.

Although dominant in numbers, the agricultural borrowing banks would tend to be smaller than other borrowing banks. Thus, of total potential seasonal borrowings of \$461 million under the 10 per cent plan, agricultural banks would obtain 26 per cent; under the 5 per cent plan they would obtain 14 per cent of total borrowings of \$2,130 million. Although agricultural banks would get a smaller portion of the total credit extended under the latter plan, they would obtain a much larger sum than under the 10 per cent plan—\$307 million versus only \$120 million.

Under either plan, however, the potential borrowings would have more impact on the agricultural banks than on the other banks, reflecting the fact that seasonal outflows are proportionately greater at agricultural banks. Borrowings by agricultural banks under the 10 per cent plan could potentially equal 5.5 per cent of deposits at the eligible banks, against only 3.0 per cent at eligible banks with few or no farm loans. The 5 per cent plan yields the same difference in potential impact. Thus, seasonal borrowing arrangements would not only benefit a greater proportion of agricultural banks than other banks, but would also be of relatively greater importance to the agricultural banks among the banks eligible to borrow.

At the eligible agricultural banks, potential borrowings under either plan would equal about one-fifth of present farm loan volume. The proposal could thus have a significant impact on farm lending at these banks.

The impact on total farm lending by *all* insured commercial banks would be much smaller, but still potentially significant, especially under the 5 per cent plan. Member banks eligible to borrow under the 10

per cent plan hold 7.0 per cent of the total farm loans outstanding at all insured banks, whereas under the 5 per cent plan the proportion rises to 22.3 per cent. Member agricultural banks eligible to borrow under the alternative plans hold 9.9 per cent and 23.8 per cent, respectively, of total farm loan volume at all insured agricultural banks. Potential borrowings are equal to 2.0 per cent and 5.2 per cent, respectively, of the total farm loan volume at all insured agricultural banks. The potential impact on total farm lending is restrained because (1) agricultural banks with large seasonal outflows tend to be small banks, and (2) two-thirds of all agricultural banks, as well as of agricultural banks with large seasonal outflows, are nonmember banks that would not be eligible for seasonal discount credit from the Federal Reserve System unless they became members, or unless a basic legislative change permitted borrowing by nonmembers.

Impact of bank liquidity on potential borrowing. It seems reasonable that banks with little liquidity, particularly at the peak of seasonal outflows, would be most likely to utilize a seasonal borrowing arrangement to advantage. The 1966 farm loan survey indicated that banks began to experience significantly increased difficulty in financing their farm borrowers when loan/deposit ratios exceeded 60 per cent. Table 31 indicates that about 34 per cent of agricul-

tural banks eligible to borrow under the 10 per cent plan, and a slightly smaller portion of those eligible under the 5 per cent plan, were illiquid to this degree at their seasonal peak. Another 30 per cent had loan/deposit ratios in the 50 to 59 per cent range, indicating that they might soon be more seriously concerned with liquidity, and perhaps might already be able to benefit from some seasonal borrowing.

At more than one-third of agricultural member banks with large relative seasonal outflows, however, loan/deposit ratios are apparently under 50 per cent—at some banks, under 40 per cent—even at the seasonal peak. Although some of these banks might exercise a seasonal borrowing privilege and perhaps thereby improve their farm lending service, their present liquidity would permit them to do so even in the absence of such arrangements. An analysis performed by the Federal Reserve Bank of Kansas City showed that many such banks do not seem to lack farm lending opportunities in their communities. Many had neighboring banks in the same or adjacent towns with much higher loan/deposit ratios, some of which were expressing concern about their inability to meet the legitimate loan demands of the area. Greater educational and other efforts to overcome the apparent managerial inertia at the banks with low loan/deposit ratios would be of service to the communities affected.

TABLE 31

DISTRIBUTION OF AGRICULTURAL MEMBER BANKS WITH FUND OUTFLOW IN JANUARY-JUNE 1966

By relative size of outflow and by loan deposit ratio on June 30, 1966

Relative fund outflow (per cent)	Loan/deposit ratio (per cent)											
	Total	Under 40	40-49	50-59	60-69	70 and over	Total	Under 40	40-49	50-59	60-69	70 and over
	Number of banks						Percentage distribution of banks					
All banks	1,663	304	376	472	355	156	100	18	23	28	21	9
Under 5	602	118	143	156	125	60	100	20	24	26	21	10
5 to 9	568	102	138	170	116	42	100	18	24	30	20	7
10 and over	493	84	95	146	114	54	100	17	19	30	23	11

Latent seasonal demands. The preceding evidence on the potential assistance of seasonal discount credit to farm lending necessarily shows only how it could help banks to cope with the seasonal loan demands that they have actually filled in the past. It is probable, however, that some—perhaps many—banks have seasonal loan demands in their communities that have not been met because of lack of funds. Again, at progressive banks this situation is likely to occur more often as liquidity is exhausted.

Although banking statistics alone cannot reveal latent seasonal demands, some indications of their existence and relative significance have already been noted in Section VI, where the trend in the amount of seasonal credit provided by banks was compared with trends in seasonal operating expenses (Table 22) and in seasonal credit provided by PCA's (Table 24).

Expenditures for current farm operating expenses with significant seasonal components increased by 3.3 per cent annually during 1950–68. Over the same period, the semiannual variation in total institutional non-real-estate debt rose at an average yearly rate of 4.4 per cent. Although this comparison is far from complete, the evidence is nevertheless consistent with the hypothesis that increased farm seasonal credit demands are being met by institutional lenders.

During the same period, however, the amount of the semiannual variation in bank non-real-estate loans rose at an average annual rate of 3.0 per cent, whereas at PCA's the average annual gain was 5.5 per cent. PCA's probably provided more additional seasonal credit than did banks over this period. In 1950–54, for instance, the average January–June loan increase at banks amounted to \$309 million, whereas at PCA's the amount was \$170 million. By

1965–68, the amount at banks had risen to \$407 million, or by 32 per cent, whereas the amount at PCA's had doubled to \$343 million.

These data are consistent with the hypothesis that banks have encountered greater difficulty in financing seasonal credit demands of farmers, presumably because increased year-round loan demands have reduced liquidity from which seasonal demands could be met. Increased seasonal demands upon PCA's were readily financed by short-term borrowings in the central money market, whereas rural banks could not easily tap this source for significant amounts. It is conceivable that some farm borrowers switched from banks to PCA's primarily because PCA's were more inclined to meet their seasonal requests—not because PCA's had a more favorable attitude toward the wisdom of such borrowing, but simply because they were much better able to cope with these demands. A seasonal discount arrangement for member banks would restore their ability to compete with PCA's in seasonal lending.

Supplemental adjustment credit. To encourage rural banks to take advantage of their eligibility for seasonal discount credit under any plan that is implemented, such a plan should clearly indicate that banks using seasonal credit remain equally eligible for additional short-term adjustment credit should circumstances make use of the latter advisable. Otherwise, at least until other financial mechanisms are improved, rural banks might be reluctant to make full use of the seasonal privilege for fear of unexpectedly finding themselves in an illiquid position.

Rural banks on the whole have not made effective use of present short-term adjustment credit available through the discount window. Clarification and simplification of

the terms of and Federal Reserve attitudes toward this privilege would be desirable to promote such use, as conditions that present no problem to sophisticated money market banks may have deterred many rural bankers. Similarly, any new regulations to govern seasonal credit extensions should be comprehensible and suitable to the rural bankers that these arrangements are intended to serve.

Longer-term credit

Many rural banks face year-round rather than only seasonal strains on their lending resources, according to loan/deposit ratios that have been examined (Table 31). Structural factors at present limit the access of these banks to financial markets in which larger and less isolated banks in the same circumstances are able to obtain funds by selling their assets and liabilities. To compensate for the market imperfections, the Federal Reserve System conceivably could provide reserves directly to the rural banks on a long-term basis. One might propose that particular rural banks be allowed to borrow at the discount window for indefinite periods, or that the Federal Reserve purchase certain assets or liabilities of these banks, such as farm loans, debentures secured by farm loans, or certificates of deposit.

However, in contrast to seasonal or other temporary assistance, provision of long-term Federal Reserve credit directly to specific banks presents severe operational and conceptual difficulties. In principle, given the situation outlined above, the Federal Reserve could try to provide the quantities of funds that rural banks might obtain if they had better access to financial markets and could try to charge the rate of interest they would have to pay in the market. But what these quantities and rates might be

and how they might be altered from time to time by changes in general monetary conditions and other factors would not be easy to determine within acceptable limits.

Nevertheless, if implemented, a program of direct compensatory assistance would undoubtedly improve the availability of bank credit to farmers, obviously a goal of its proponents. Paradoxically, this effect, although it might be in the public interest, creates a fatal conceptual difficulty. As a principle of sound monetary policy, the Federal Reserve will not knowingly enter upon programs in which its credit-creating powers are used for the special benefit of a particular sector of the economy or in which it is called upon to allocate credit among specific uses. Through the years, Congress has reinforced this view of the proper role of the Federal Reserve by turning to or creating nonbank financial institutions to augment credit supplies for specific economic sectors judged to be in need thereof, rather than by asking the Federal Reserve to deliberately influence the allocation of credit to these uses. Because it would be difficult to determine the point at which compensation for market imperfections ends and favoritism toward farm credit begins, it is also difficult to visualize the Federal Reserve adopting a program of direct long-term assistance.

This conclusion about direct long-term credit, however, does not negate the fact that a central bank can obtain equitable and satisfactory results in supplying reserves mainly through open market operations only if financial markets are well developed, as they generally are in the United States. Thus, the Federal Reserve has an implicit stake in the development and maintenance of financial markets that serve all sectors of the economy. It should work toward perfection of markets on which the fairness and success of its procedures depend, and it has

done so on numerous occasions. In the face of decreased rural bank liquidity, and given that unit banking is required in many primarily agricultural States, the Federal Reserve should now undertake to secure improvement of secondary markets for assets and liabilities of rural banks, including agricultural paper and debentures secured by agricultural paper. The Federal Reserve has the knowledge and resources to take an active role in the development of secondary markets such as those outlined in the next section. If necessary, for example, the Federal Open Market Committee could extend material support to an embryonic market through a controlled volume of trading in its instruments, similar to the manner in which the FOMC has helped to establish the market for bankers' acceptances.⁵³ The

⁵³ Much of the Federal Reserve System's rationale for purchases of bankers' acceptances and its procedures and experience in this market appear transferable to the proposed dealings in rural bank paper or an instrument secured by such paper. For instance, in describing operations in bankers' acceptances, Roosa states "the Federal Open Market Committee, in recognition of the potentialities for further use of

Federal Reserve System and its FOMC should not ignore the structural imperfections in financial markets and instruments that discriminate against small and isolated banks.

bankers' acceptances that may be inherent in the expanding role of the United States in financing world trade, and for other reasons, decided to resume the acquisitions of a portfolio in bankers' acceptances for the System itself. . . . The Federal Reserve has not, as a matter of practice, sold acceptances out of its portfolio. . . . there are almost always some acceptances maturing every day, and in a relatively short time maturities alone can run the holdings down as far as might be appropriate in conforming to the direction of other credit policy action. . . . the job of the acceptance clerks is . . . one of . . . verifying the negotiability . . . as well as inquiring, under some circumstances, into the credit standing of the business concern drawing the acceptance. Because of the nature of this paper, however, the principal reliance as to its soundness is placed upon the name of the accepting bank and the added endorsement which the acceptance carries. Current lists are maintained of all banks in the United States engaged in extending acceptance credits, and the condition of each such bank is periodically reviewed." See Robert V. Roosa, *Federal Reserve Operations in the Money and Government Securities Markets* (Federal Reserve Bank of New York, 1956), pp. 87-90. Recent year-end Federal Reserve holdings of bankers' acceptances have approached \$200 million.

IX. UNIFIED MARKETS TO SERVE RURAL BANKS

Unified markets—in which small and rural banks could obtain market information and conduct trading in a wide variety of portfolio items in units that correspond to their needs—would improve the flow of funds to rural areas. These institutions could provide rural banks with both market information and trading facilities for purchases and sales of Federal funds and Government securities, placement and secondary marketing of certificates of deposit, and secondary marketing of loan paper. With these services centralized in one location, rural bank managers would have the market options now effectively available only to larger banks,

as well as the information necessary for proper decisions—for example, whether to raise funds by selling bonds, discounting loan paper, or participating in a certificate of deposit issue. More transactions would become profitable—some are not now economical because of the small amounts involved and the numerous telephone calls to different markets required—and rural banks would have an enhanced ability to respond to changing loan demands and other conditions.

Structural and operational aspects of a unified market are considered in this section. First, some ideas for its basic organi-

zation are advanced. Next, the approach the agency might use in providing a secondary market for rural bank paper is analyzed in some detail. Although the unified market would be most effective if all major types of commercial bank loan paper were traded, only non-real-estate agricultural loan paper is covered herein, because the primary concern is with availability of credit to farmers. However, much of the analysis also applies to trading in other types of paper. Finally, the prospective role of the unified market in trading in other instruments—Federal funds, certificates of deposit, and bonds—is briefly discussed.⁵⁴

Organization

The cardinal principle in organization of a unified market should be to provide rural bankers with a maximum amount of information and service for a minimum of expense and effort on their part, just as present money markets are organized to invite and expedite trading by large institutions. Reasonably convenient facilities, adequate capital, and a knowledgeable operating staff are essential, as are a competent research staff and appropriate facilities for gathering and disseminating information.

To attain these goals in the most effective and efficient way, operations of regional unified markets should be coordinated and supervised by a national agency. Given present and foreseeable developments in communications and computer technology, a national network of unified markets can constitute a practical and desirable addition to the Nation's financial mechanisms.

⁵⁴ For additional discussion of the unified market concept, see Raymond J. Doll, "Unified Markets for Rural Banks," *Banking, Journal of the American Bankers Association* (Jan. 1969), pp. 63–65; and "Unified Markets to Facilitate Exchange of Bank Assets and Liabilities," *Bank News Magazine* (June 1969), pp. 13–18.

A secondary market for rural bank loans

Successful secondary markets for loans made by rural banks would materially increase the banks' ability to finance rural communities. Development of such outlets would be a primary goal of unified markets.

There are two basic ways in which a market for such paper could be provided. First, the unified market could simply bring together buyers and sellers of the notes. Or the market, acting as an agency, could sell debentures and use the proceeds to purchase rural bank paper. By either method, if the market is effective, a bank that is loaned up could obtain funds by selling notes from its portfolio. It could then use these funds to make additional loans.

Trading in loan paper. Direct sale of loan paper to investors avoids the more complicated process of issuing debentures, with the market itself becoming directly involved with questions of risk. However, the market for such paper might prove quite thin, as most of the notes are small and frequently in odd amounts and maturities. But even if direct sales were restricted to the larger farm notes of borrowers for whom financial and credit ratings are readily available, significant sums might be obtained and rural banks would be especially encouraged to provide adequate financing for the larger farms and other firms located in their community.

To increase the marketability of loan paper, the unified markets could provide or arrange for some form of insurance that would reduce or eliminate the risk of loss to the purchaser of an individual note (alternative insurance plans are discussed later). In so doing, however, the markets would probably become involved in risk determination to about the same extent that they would if they had bought the paper themselves in a debenture operation.

Sale of debentures. The alternative method—sale of debentures secured by loans—would resemble the present operations of the cooperative farm credit system, particularly those of the Federal intermediate credit banks. These banks have been able to raise funds in national capital markets and use the proceeds to discount agricultural paper of the production credit associations. This process has proved efficient, and much of the experience would be transferable to the operations of unified markets. Also, favorable investor experience with these issues should improve initial marketability of unified market debentures.

The unified markets could logically use both approaches. They could act as direct brokers, where feasible, in bringing together buyers and sellers of rural bank paper, and in addition could issue debentures to raise funds for purchase of such paper from commercial banks. These debentures should be joint obligations of all unified markets—with only the paper purchased by these unified markets being used as security.

The primary advantage of debentures is that they would enjoy a much broader market than individual notes because they would be issued in standard sizes, have more diversified security than individual notes, and would not require a new investigation by the potential investor for each purchase. Thus, they could undoubtedly be sold in larger volume and at lower interest rates than individual notes.

Insurance mechanisms. The attitudes of bankers and bank examiners make it unlikely that significant amounts of discounting can be done if bankers must retain the risk on the paper sold. It seems desirable, therefore, that all sales be made on a non-recourse basis, with controls established to prevent bankers from ignoring the credit risks. One such control is insurance. Sellers

could be required to buy insurance on each note sold to the markets, with the rate depending on the note's risk classification, but high enough to build up an adequate reserve.⁵⁵ Such insurance could be funded by the markets themselves or handled by private insurance companies. The markets could underwrite the insurance by acting through a central body to achieve geographical diversification. While the principle of insurance is applicable whether loan paper is traded or debentures are issued, insurance would be of particular benefit—or be virtually required—in the former case, where it would reduce risk differentials and greatly increase the probable number of market participants.

Alternatively, the markets could provide for risk differences by varying the offering price according to the risk classification of each note. Prices could be adjusted so that, after allowance for probable losses, the rate of return on all notes would be the same. Over the long run, the price differences would exactly compensate for losses. Administrative costs of insurance would be saved, but the risk classification process would entail some costs and difficulties.

The insurance problem might be better handled by a third alternative, the establishment of a reserve account for each bank. For instance, if a bank's actual losses average 0.5 per cent, payment into its reserve account might proceed at the rate of 1 per cent of new loans sold until the reserve equaled 2.5 per cent of total loans sold and still outstanding. Payments into the account would then cease until there was either a net increase in the bank's activity or a loss

⁵⁵ Available evidence indicates that default losses on bank agricultural loans average less than 0.5 per cent. Average insurance rates would, of course, have to be slightly higher to cover other insurance costs, although the insurance rate charged for high-quality loans might still be less than 0.5 per cent.

on one of its notes—in which case, they would be resumed at a rate of 1 per cent of new sales. The relative size of the reserve would be varied according to losses experienced over an appropriate period.

Losses larger than the reserve account would be borne by the markets, so the procedure would be equivalent to sales on a limited-liability basis. Bankers who sold very high-quality paper would be rewarded by very low insurance costs once the reserve was established. Among the possible disadvantages is the likelihood that some bankers might be reluctant to change an established volume of loan sales because this would require additional payments into their reserve accounts. The accounts also would require continual supervision, but total administrative costs might well be lower than in the preceding alternatives because individual notes would not have to be evaluated for risk.

Education. To realize the full potential of secondary marketing of loan paper, a major educational program would initially be desirable to demonstrate the need for and benefits of secondary markets to bankers and their customers. Such mutual understanding would help preclude damage to customer relationships when banks market loan paper.

Unfortunately, the mere existence of a secondary market for rural bank paper would not eliminate the managerial inertia that exists in some rural banks. However, these banks would be placed under more pressure than at present, from their competitors and customers, to improve their credit services to their communities.

Other services of unified markets

Federal funds. Inclusion of Federal funds activity in the unified markets would assure rural banks of greater access to the funds

market, particularly on the buying side. At present, participation by small banks is largely dependent on the willingness of city correspondent banks to act as brokers or dealers in Federal funds. Accommodation hinges on whether the correspondent has complementary reserve needs or can match the wishes of two country correspondents. Under other circumstances, correspondent banks appear much less willing to accommodate small transactions in Federal funds. By acting as a dealer, a unified market could give small banks access to the Federal funds market on a basis that is continuous, certain, and independent of a correspondent.

Unified markets probably could provide most effective service in Federal funds by taking dealer positions. This operation would enable banks to accommodate transactions of differing size and would allow them to offset net buying or selling by their customers through trading in the national market—in effect, by acting as wholesalers of Federal funds. In addition, a dealer operation would stimulate trading because a selling bank would not have to concern itself with the solvency of a different small bank each time it sold or to establish restrictive lists of banks to which it would sell.

The minimum trading unit needs to be relatively small if banks serving rural areas are to be able to participate effectively. Also, small banks might arrange to have the markets buy or sell funds for them for specified periods of time on some automatic basis. For example, a bank might place a standing order for purchases or sales whenever its excess reserves vary by one trading unit from a specified amount. Another more sophisticated approach would rely on daily computer analysis by the unified market of each bank's reserve account, with decisions about whether and how much to trade being

based on recent patterns of its reserves and of Federal funds rates, the stage in the settlement period, and the existing Federal funds rate, as well as the bank's current reserve position. The unified market would need ready access to the most recent information about each bank's position for this approach to be most effective. Arrangements could probably be made, with authorization from the commercial banks concerned, for unified markets to obtain current reserve status data directly from Federal Reserve Banks at which these accounts are kept.⁵⁶

Certificates of deposit. Unified markets could further improve the geographical distribution of credit by facilitating the issue of certificates of deposit by rural banks. Rural commercial banks have been excluded from the market for negotiable CD's primarily because the standard size of those traded is so large. For a bank with \$5 million to \$10 million in deposits, a \$1 million CD—for that matter, even one for \$100,000—simply is not a satisfactory instrument; it is too large, relative to the bank's needs and resources, to be attractive either to the bank or to potential investors.⁵⁷

A unified market could enable smaller banks to compete for time deposit money by offering certificates in which a number of affiliated banks participate. Such certificates, of course, would be only partly insured by the Federal Deposit Insurance Corporation under existing regulations, and so a prospective purchaser might need to investigate a number of banks in order to evaluate the

total risk inherent in a given certificate. To make such certificates marketable, it might be necessary for the unified market to accept liability for them. With proper supervision, unified markets should be able to guarantee such instruments with minimum risk. If insurance or guarantees were secured, the certificates almost certainly could be traded in the existing market.

But if the unified markets cannot guarantee certificates issued jointly by small banks, it might still be possible to establish a new market for such issues. The certificates would be classified as nonprime and thus expected to carry a slightly higher rate of interest than prime-name certificates. Also, many relatively small certificates would likely be sold to allow issuing banks to obtain maturities of desired length and diversity. With sufficient effort, a new group of investors might be attracted to these higher-yielding small issues, including smaller corporations, banks, other financial institutions, and even individuals.

The volatility of demand for small certificates could prove less than that experienced in the present large-certificate market, thus making these instruments a more appropriate source of funds for small banks. And in particular, banks with well-established seasonal patterns in local deposits and/or loans could meet seasonal outflows by timing the maturity of certificates to coincide with periods of loan repayment or deposit inflows.

The development of a strong demand for these small, joint-issue CD's will be dependent on a good secondary market for them, thus making it important for the unified markets to act as brokers in resales as well as in original issues. The Federal Reserve System could contribute to market development by making its wire facilities available for transfer of certificates. If offices of the

⁵⁶ For more information on the present structure of the Federal funds market and some other suggestions for improvement, see Parker B. Willis, *A Study of the Market for Federal Funds*, vol. 3 of this series.

⁵⁷ Description and evaluation of the present secondary market for negotiable certificates of deposit and review of numerous suggestions for improvement are provided by Parker B. Willis in *The Secondary Market for Negotiable Certificates of Deposit*, vol. 3 of this series.

unified market also stored and redeemed certificates, costly mail transfers would be avoided and marketability thereby enhanced.

Bond services. Another activity valuable to participating banks would be information and brokerage services in U.S. Government securities and municipal bonds. Unified mar-

kets could provide up-to-the-minute bond quotations along with analysis of bond market trends and conditions. Using this and other information provided by the markets, bankers could choose the alternative for raising or investing funds that is best suited to their specific situation in each instance.

X. CONCLUDING COMMENTS

If rural banks are to finance rural capital investment effectively in the future, they must increasingly assume the role of intermediaries that facilitate flows of funds from money market centers. But present banking and money market mechanisms are ill-suited to the needs of progressive rural bankers who undertake this task.

With many rural banks encountering liquidity problems today—and such situations likely to intensify as well as multiply in the future—the Federal Reserve System should act promptly to provide more reserves directly to such banks, while simultaneously seeking to perfect market mechanisms. Rediscount procedures should be immediately revised to provide a greater volume of seasonal credit on a more appropriate basis than heretofore. Discount procedures in general should be revised as necessary to encourage and facilitate use of this source of funds by rural banks.

These measures, promptly instituted, would buy time during which financial market mechanisms could be improved to accommodate the needs of small and isolated banks. The Federal Reserve System, and particularly its Federal Open Market Committee, should face up to indications that such banks are unable to compete for funds with money market banks and other agencies. Federal Reserve distaste for providing

long-term discounts to disadvantaged banks, or for purchasing their securities in the open market, is justified only if financial markets are structured to permit such banks to compete for available funds. The Federal Reserve System thus has both an obligation and a stake in securing market perfections that make more significant and equitable participation by small banks possible.

One of the more effective ways to overcome present deficiencies might be through establishment of a network of unified markets to handle transactions in the assets and liabilities of small banks. A device to permit these banks to market farm and other notes should constitute a vital part of the services provided by such markets. In this and other financial instruments, unified markets could provide one-stop information and service to small banks.

As these various measures are taken, a considerable number of rural bankers would, as judged from present liquidity levels and trends, be waiting to utilize them. However, perhaps an equal number, judging from the same banking statistics, are not now serving the loan demands of their communities as well as their present liquidity status would permit. Federal Reserve Banks could render valuable service by conducting educational programs aimed at overcoming or minimizing managerial inertia at such banks, both

now and especially as improved sources of funds are established. As knowledge of the improved sources spreads, more community pressure on inert banks could also be expected.

The Federal Reserve System can make a real contribution to rural finance by helping to achieve the legislative, regulatory, and market changes required by these recommendations, as well as by arousing private

individuals and institutions to face the challenges presented. The proposals are revolutionary in their implications for city correspondent banks, for rural banks characterized by managerial inertia, and for the discount officers and the Federal Open Market Committee of the Federal Reserve System, but no more so than the sweeping changes in rural economies that have made them necessary.