A THEORY OF THE BANK FIRM

by
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PREFACE

Every scholar dreams of discovering a so-called "significant gap in the literature." I believe that one such gap in economics is the theory of the banking firm. Whether this dissertation in any way contributes to the filling of this gap is moot indeed, but the attempt has been a fascinating one for me.

This study traces its ancestry to a paper prepared for the University of Michigan Seminar in Monetary and Banking Problems, presided over by Professors Leonard L. Watkins (now Emeritus) and Richard A. Musgrave. Both of these men expressed the belief that I could develop this topic into a dissertation, and it was largely as a result of their encouragement that the task was undertaken.

I am profoundly grateful for the assistance and intellectual stimulation of the members of my doctoral committee; but my largest debt is to Professor William B. Palmer, who, as chairman, spent uncounted hours in reading and evaluating preliminary drafts of various sections, in corresponding with me, and in arranging and attending meetings between the committee and myself.

Through the careful scrutiny of the committee, many of the serious errors of omission and commission have been corrected; but the blame for the faults which remain, as well as for those which were eliminated, rests on me.

Thomas E. Van Dahm

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CHAPTER I

INTRODUCTION

Purpose

Probably no type of private economic institution has been written about so extensively as has the commercial bank. Considering the crucial role played by the banking system in our monetary economy, this fact is not all surprising. What is surprising is that no theory of the behavior of banks has appeared.

To be sure, there is a body of theory concerning the bank. Some notion of how banks react to various stimuli is implicit in most recommendations and actions in the fields of monetary and fiscal policy. Furthermore, analyses of the effects of such influences as bank taxation, legislation regarding bank practices, and regulations of the types and proportions of assets banks may hold - all hinge upon views of bank behavior, or at least of certain aspects of it. Moreover, certain elements of a theory of the bank have received more or less formal development. One thinks of the theory of bank borrowing as developed by Riefler, Burgess, Turner, and others.[1] And there has been extensive discussion

[1] Winfield W. Riefler, Money Rates and Money Markets in the United States (New York, Harper & Bros., 1930); W. Randolph Burgess, The Reserve Banks and the Money Market (New York: Harper & Bros., 1927); and Robert E. Turner, Member Bank Borrowing (Columbus: Ohio State University, 1938).

of "credit rationing" in recent years, stimulated by Keynes' "fringe of unsatisfied borrowers." Shaw has attempted to provide at least a partial framework for analyzing the bank firm, with the result that such terms as "response coefficient" and "loan coefficient" have entered the vocabulary of the student of monetary economics.[1]

The job of constructing a more or less well-rounded theory of the bank firm has yet to be done, however; and this study has as its goal the development of the rudiments of such a theory. The author is under no delusion that between these covers is bound the alpha and omega of a theory of the bank firm, but it is hoped that this work may at least constitute a step in the right direction.

Although the development and presentation of a systematic analysis of the behavior of the bank firm is the main goal of this study, several incidental results will be forthcoming. First, certain generalizations concerning bank behavior will be subjected to close scrutiny and, in some cases, will be seen to be inconsistent with the facts or directly opposed to other generalizations. Second, certain insights and theoretical constructs regarding bank behavior will be integrated into a broader theoretical framework. Third, certain general theoretical concepts in economics will be given specific application to the bank-type firm - liquidity preference (or, more broadly, "asset preference") and cost and revenue functions

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[1]Edward S. Shaw, Money, Income and Monetary Policy (Chicago: Richard D. Irwin, Inc., 1950).

may be mentioned as examples. Fourth, since "asset theory" often uses the bank as an example of certain of its general principles, there is afforded here an opportunity to verify these examples and perhaps to suggest further generalizations. Finally, because monetary policy is so closely tied up with the behavior of banks, a framework allowing a more systematic treatment of the variables involved in bank behavior may contribute toward making monetary policy less an art and more a science.

It may occur to the reader that, since we already have a theory of the firm, and since the bank is a type of firm, the proper procedure would be to apply the conventional apparatus of the theory of the firm to the specific class of firm called the bank, rather than to construct some ad hoc machinery to deal with the bank-type firm. This matter will be discussed at some length in Chapter III; at this stage it is simply asserted that the conventional theory of the firm is of limited usefulness in analyzing the behavior of banks.

Ideally, of course, the theory of the firm should be adequate for the analysis of all types of firms, ranging in size from a popcorn stand to great industrial, financial, and merchandising combines and ranging in types of operation from a general store to a steel fabricator to a chain of diaper laundries. However, due to the wide variety of institutions encompassed by the term "firm", the scope of generalizations of such a theory tends to be severely limited: one says less and less about more and more. As Stigler put it: "Abstraction, in the sense of reduced empirical content, is the inevitable

price of generality of scope, and indeed abstraction and generality are virtually synonymous."[1]

An alternative to the foregoing highly general approach to economic theory is described by Triffin:

> The way is now open for the building up of a different type of economics. Instead of drawing its substance from arbitrary assumptions, chosen for their simplicity and unduly extended to the whole field of economic activity, our theory may turn to more pedestrian, but more fruitful methods. It will recognize the richness and variety of all concrete cases, and tackle each problem with due respect for its individual aspects. More advantage will be taken of all relevant factual information, and less reliance will be placed on a mere resort to the pass key of general theoretical assumptions.[2]

Thus, by focusing attention on a specific type of firm, the bank firm, we hope to gain more insight into the behavior of banks and similar institutions.

Scope

The above paragraphs suggest two questions: "What is a bank, as the term is used herein?" and "What aspects of its behavior are to be examined?" The first question is not so quickly disposed of as might be assumed at first thought. It is easy to say simply that the scope of this study is limited almost entirely to the individual commercial bank firm - which is, in fact, the case - but the differences between this type of firm and other types should be examined in order to suggest, at least in a general way, the degree to which the following

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[1]George Stigler, The Theory of Price (New York: The Macmillan Co., 1947), p. 10. Italics in original.

[2]Robert Triffin, Monopolistic Competition and General Equilibrium Theory (Cambridge: Harvard University Press, 1940), p. 189.

analysis might be applicable to classes of firms other than bona fide commercial banks.

The differences between commercial banks and other financial institutions, while genuine, are easily exaggerated. From the standpoint of functions, the studies of the National Bureau of Economic Research on business finance stressed the fact that commercial banks and other lending institutions have been becoming more and more alike. During the 1900-1940 period,

> the newer business lending agencies [i.e., industrial banking companies, commercial finance companies, and personal finance companies] showed an increasing tendency to extend credit in areas customarily served exclusively by commercial banks, just as commercial banks tended, much more extensively, it should be observed, to do a "finance company" type of business. As a result, functional distinctions became blurred and in some instances almost completely disappeared.[1]

The older private business financing agencies, such as life insurance companies and factoring companies, likewise came to resemble commercial banks more closely, and vice versa, in various aspects of their services to business. And the emergence of public agencies which furnished credit to business further reduced any claims of uniqueness that might be made concerning the functions of commercial banks.[2]

On the liabilities side, however, despite the fierce competition with other depositories of savings - savings and loan associations and savings banks in particular - banks still have a virtual monopoly on the creation of deposit money. Even

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[1] Neil H. Jacoby and Raymond J. Saulnier, Business Finance and Banking (New York: National Bureau of Economic Research, Inc., 1947), p. 117.

[2] ibid., pp. 118-130.

here, however, the monopoly is not complete: some industrial banks have been granted permission to handle a checking account business, particularly of the no-minimum-balance variety, on the theory that this is a worthy service to the "little man"; but the magnitude is extremely small relative to commercial bank deposits.[1]

Attention is called to several other similarities and differences between banks and other types of financial firms in the following quotation from Gurley and Shaw:

> Each kind of non-monetary intermediary can borrow, go into debt, issue its own characteristic obligation - in short, it can create credit, though not in monetary form. Moreover, the non-monetary intermediaries are less inhibited in their own style of credit creation than are the banks in creating money. Credit creation by non-monetary intermediaries is restricted by various qualitative rules. Aside from these, the main factor that limits credit creation is the profit calculus. Credit creation by banks also is subject to the profit condition. But the monetary system is subject not only to this restraint and to a complex of qualitative rules. It is committed to a policy restraint, of avoiding excessive expansion or contraction of credit for the community's welfare, that is not imposed explicitly on non-monetary intermediaries. It is also held in check by a system of reserve requirements.[2]

Thus it seems reasonable to expect that many of the generalizations made herein will be applicable to certain other financial institutions. Some effort will be made to cite studies of these other types of institutions in passing, but primary emphasis will be on the commercial bank. Unless qualified, the

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[1]William H. Steiner and Eli Shapiro, Money and Banking (3rd ed.; New York: Henry Holt & Co., 1953), p. 835.

[2]John G. Gurley and Edward S. Shaw, "Financial Intermediaries and the Savings-Investment Process," Journal of Finance, XI (May, 1956), pp. 262-263.

term "bank" as used in this study will refer to the commercial bank as that term is generally understood.

Differences between commercial banks and nonfinancial firms, although quite familiar, are sharply pointed up by a comparison of the composite balance sheets of "all banks" and "295 selected large firms" for December 31, 1955, as reported in the Federal Reserve Bulletin (Table I).

The first differentiating characteristic is found in the fact that, for banks, the liabilities side is more nearly "given" than the asset side while for business firms generally the contrary is true.

> Banks, owing large sums to the public payable on demand or short notice, seek to acquire a set of assets that will enable them to meet their liabilities under all foreseeable conditions. The asset structure of commercial and industrial enterprises, in contrast, is broadly determined by their production technology; the major financial problem of these concerns is that of choosing an appropriate structure of liabilities.[1]

Since the present study is concerned with the bank, it seems appropriate that we consider liabilities first.

The major difference between the liabilities of these two groups of firms is that of the time-distribution of liabilities. The banks are faced with a set of liabilities made up largely (91 percent) of demand and short-time varieties, with but a small percentage of the "perpetual" kind. The exact opposite situation characterizes the "large firms" sampled, over four-fifths of their liabilities are either long-term or perpetual. Inevitably, the appropriate asset structures will differ

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[1] Jacoby and Saulnier, op. cit., p. 210.

TABLE 1

COMPARISON OF ALL BANKS IN THE UNITED STATES AND 295 LARGE CORPORATIONS[a] BY ASSET AND LIABILITY STRUCTURES, DECEMBER 31, 1955

Account	Total ($000,000)		Percentage of total	
	295 large corporations	All banks in U.S.	295 large corporations	All banks in U.S.
Total assets	140.5	242.0	100.0	100.0
Cash assets	7.3	47.8[e]	5.2	19.7[e]
Accounts & notes receivable	12.4	100.1[f]	8.8	41.3[f]
U.S. Government securities	12.2	70.1	8.6	29.0
Other securities	b	20.7	b	8.6
Inventories	21.0	b	15.0	b
Plant and equipment	77.8[c]	b	55.4[c]	b
Other assets	9.7	3.3	6.9	1.4
Total liabilities	140.5	242.0	100.0	100.0
Demand liabilities	d	143.6	d	59.3
Other current liabilities	24.7	76.8	17.6	31.7
Long-term & other liabilities	30.0	3.5	21.4	1.4
Capital accounts	85.7	18.1	61.0	7.5

[a]Composed of 198 manufacturing, 41 retail trade, and 56 utilities corporations.

[b]Included in "other assets."

[c]Net of reserve for depreciation.

[d]Included in "other liabilities."

[e]Excludes reciprocal balances.

[f]Includes all bank loans.

Source: Federal Reserve Bulletin, July, 1956 pp. 586,609.

widely, illiquid liabilities being demanded by illiquid assets in the one case, liquid liabilities demanding liquid assets in the other. Greater liquidity of bank assets takes the form of a far higher proportion of cash and intangibles readily convertible to cash with minimal likelihood of sizeable change in value. These classes evidently accounted for less than one-fourth of the assets of the large firms.

Banks' holdings of large amounts of intangibles which are subject to price fluctuation, coupled with the presence of large amounts of demand liabilities and relatively low capital ratios, make them far more sensitive to fluctuations in interest rates, actual and expected, than are business firms in general. A substantial drop in asset prices, along with an unusually heavy demand by depositors for conversion of deposits into currency and an unfavorable clearing balance, could conceivably impair seriously the banks' capital position and result in insolvencies - as has, in fact, happened at times in the past. This is not to imply that business behavior is unaffected by interest rate changes but rather that the extent and nature of the response in terms of asset behavior is different in the two cases.

Significant differences between banks and business firms might also exist with respect to their goals and motives. The major distinction usually cited concerns the role of profits versus liquidity needs in motivating the two groups of firms. Business, it has long been said, seeks to maximize profits, while banks must somehow compromise between liquidity and earnings. The force of this distinction has been considerably lessened,

however, as the role of liquidity as a determinant of business behavior has received more attention in theoretical writings. This topic will receive some discussion below, so all that need be said here is that the role of liquidity requirements in determining bank behavior seems to be similar in kind to its role in influencing business behavior generally.

Even allowing for the liquidity factor, however, it is still not agreed generally that banks attempt to maximize profits in the narrow (usual) sense of the word. According to Kimmel, "The average bank management is willing to pursue a conservative policy on risk assumed, so long as a moderate profit is obtained."[1] And Roland Robinson states the goal of the bank firm to be "not just the maximizing of [profit] but rather the getting of satisfactory earnings without jeopardizing survival".[2] There appears to be no way of reconciling the view exemplified in the two foregoing quotations with that which avers that banks attempt to maximize profits within limits imposed by liquidity needs,[3] and the present author has no inclination to take sides on the matter. However, evidence to be introduced later indicates that banks do respond to changes in the structure and level of interest rates and to changes in relative risks and costs,

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[1]Lewis H. Kimmel, The Taxation of Banks (New York: National Industrial Conference Board, 1934), p. 130.

[2]Roland I. Robinson, The Management of Bank Funds (New York: McGraw-Hill Book Co., Inc., 1951), p. 388.

[3]Cf. George P. Martin, "A Comparison of the Economic Roles of Multiple Outlet Banking and Unit Banking in California, 1920-1950," (Unpublished Ph.D. Dissertation, Indiana University, 1952), p. 175.

signifying that bankers are at least not indifferent to the attractiveness of higher earnings obtainable from an asset-mix different from their present one.

There is one aspect of goals and motives, however, in which many banks differ markedly from the usual business firm, and that is in their role vis-a-vis the local community.

> Our American banks have too generally maximized the obligation of the bank to the community. Throughout our history /there has existed/ a popular feeling that whatever funds a bank has ought to be devoted to the promotion of local enterprises and not to be loaned or invested elsewhere. .../The/ bank's basic obligation to depositors was forgotten...Unfortunately the doctrine is still dominant in many local areas.[1]

Certainly there is no analogous tradition in most other businesses. In so far as, and wherever, it is still effective, the "community service" motive must be reckoned with as a mark of difference between banks and the general run of business firms.

A final distinction between banks and other types of firms - one which, like the one just mentioned, does not appear to be universal among banks - is the propensity of the bank to allow itself to be "used" for the furtherance of other interests of "insiders." This was especially prevalent in the early years of our nation's banking system. During the period between the demise of the Second Bank of the United States (1836) and the Civil War, it was customary for the stockholders to borrow against their stock to pay their capital subscriptions. Mueller reports that "in an examination of banks in 1839, the Vermont

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[1]Ray B. Westerfield, Money, Credit, and Banking (rev. ed; New York: Ronald Press Co., 1947), p. 231.

commission discovered that the indebtedness of the stockholders amounted to one-quarter of the total loans and that two-thirds of the original capital had been borrowed by the stockholders."[1] Banking was regarded as an adjunct to the stockholders' business interests; therefore, what was to be maximized was not the bank's profit but the profits of all the enterprises involved. During the 1882-1910 period, "many [banks] were adjuncts to industrial concerns in smaller communities and were dominated by their owners. They served special interests rather than the community at large."[2] And according to Herbert Tout, writing in the mid-thirties, in many small Minnesota towns "The banker often uses the bank as a place from which to conduct ancillary business on his own behalf," such as insurance and real estate.[3]

Although legislation has done away with the worst practices of this type, in recognition of the fact that unlimited profit-maximization and socially desirable banking do not always mix, probably there still remain many situations in which the bank's interests are not held paramount. Smith and Hengren give as one reason why banks often do not seek additional capital the fact that often the "bank ownership is concerned

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[1]F.W. Mueller, Money and Banking (New York: McGraw-Hill Book Co., Inc., 1951), p. 271.

[2]Fritz Redlich, History of American Business Leaders, vol. II, The Moulding of American Banking: Men and Ideas (Ann Arbor: Edwards Brothers, 1940-1951), p. 175.

[3]Herbert Tout, "Characteristics of Country Banking," A Type Study of American Banking: Non-Metropolitan Banks in Minnesota, ed. Russell A. Stevenson, (Minneapolis: University of Minnesota Press, 1934), p. 13.

primarily either with maintaining social position or with obtaining indirect rather than direct profit.../i.e., the/ bank often serves as a local clearinghouse of economic opportunity."[1]

In so far as this factor influences the decisions and actions of banks and in so far as the ordinary business firm exhibits no similar characteristics, this constitutes an additional mark of differentiation between banks and business firms in general, although it must be stressed that no attempt to assess the importance of this characteristic is made here.

To summarize: the major differences between bank firms and business firms can be found in their balance-sheet structures, their goals and motives, and their susceptibility to being used as a means to further other interests of the owners and insiders.

Now, taking up the second question posed at the beginning of this section, "What aspects of bank behavior are to be examined?" the answer is: we are concerned with those aspects of bank behavior that directly affect the makeup of the bank balance sheet. In other words, we are concerned with (1) the determinants of the bank's equilibrium balance-sheet composition and, to a lesser degree, size; (2) the mechanics of adjustment of composition and size; and (3) the factors that induce efforts by the bank to alter them. The reason for giving emphasis to these aspects of total bank behavior is that they are,

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[1]Tynan Smith and Ray E. Hengren, "Bank Capital, the Problem Restated," JPE, LV (December, 1947), p. 555.

by all standards, the most important from an economic standpoint.

Method

For maximum usefulness, a theory should have both formal and empirical validity.[1] That is, it should not only be based on logically correct reasoning from stated hypotheses but it should also explain the phenomena of concern to the investigator. To that end, the variables and hypotheses chosen, and hence the conclusions reached, should bear some relation to reality, lest the theory amount to no more than an exercise in logic. In this study, guided by these considerations, an effort has been made to follow the principles of logical reasoning, to choose variables that are important in banking behavior, and to hypothesize in the light of commonly-accepted views of the ways in which banks react to various stimuli.

The plan or organization of the study also embodies an attempt to follow empirical as well as logical goals. Following "background" chapters (II and III) in which several approaches to the study of the bank are examined, a simple theoretical model is presented in Chapter IV, using as variables the three main asset classes - reserves, loans, and investments - and their determinants. It is explicitly recognized that this model is greatly oversimplified as a representation of an actual bank; but the claim is made that certain banking problems can be illustrated and discussed advantageously in terms of the frame-

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[1] Cf. Stigler, op. cit., pp. 4-8.

work developed in that chapter.

In the next five chapters (V-IX), the determinants of the bank's asset-structure introduced in Chapter IV are discussed in detail, with references to theoretical and empirical literature used to buttress the various arguments. Chapter X shifts attention to the liabilities-mix and its determinants; Chapter XI considers size as a variable subject to bank action. Of course, all three - asset structure, liability structure, and size - react on each other and are part of the overall problem of the equilibrium of the bank firm. Still, they are distinguishable for analytical purposes, and it is felt that the gains from considering them one at a time outweigh any artificiality involved in using this ceteris paribus approach. Every effort has been made to point out these interrelationships where appropriate. In Chapter XII the study is summarized, certain general conclusions drawn, and appropriate areas for further research (which are all too abundant) are indicated.

CHAPTER II

DEVELOPMENTS IN THE THEORY OF THE BANK

Analysis of the non-bank firm nearly always utilizes income-statement magnitudes, while analysis of the bank firm is almost invariably presented in balance-sheet terms. "In one case, an elaborate paraphernalia of cost and demand curves serves as the foundation of analysis. Profit maximization reigns supreme. In the other case, this apparatus disappears. Attention is focused on balance-sheet position, and primary emphasis shifts to liquidity (reserve maintenance) considerations as a means of meeting equity commitments (deposits)," observes W.W. Cooper.[1]

There are good reasons why two different approaches have evolved. In banks and other financial firms, assets and liabilities are the focus of attention; policy decisions revolve around such matters as reserve ratios, investment portfolios, and the like. For firms dealing in, processing, or otherwise handling material economic goods, on the other hand, attention is directed to various kinds of flows: the conversion of inputs into outputs, such as soiled clothes into clean clothes, autos in Detroit to autos in Keokuk, fresh pears into canned pears.

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[1] W.W. Cooper, "Theory of the Firm: Some Suggestions for Revision," AER, XXXIX (December, 1949), p. 1207.

Another possible reason for this duality in treatment of the two types of firms is that ordinary firms have been assumed to be attempting to maximize a certain flow variable called "profits," while the bank is usually described as pursuing a policy that strives for liquidity and solvency above all and for profits only after these basic needs have been met. Since liquidity and solvency are balance-sheet attributes and profit is an income-statement item, it was logical that discussions of these two classes of firms should have developed along different lines.

While the (flow) theory of the firm has long received much attention from economists and, in some respects, has been developed to a high degree of logical precision, it is no exaggeration to state that, at the present time, the theory of the bank is largely inchoate. This condition seems somewhat anomalous, since there are great masses of data and numbers of studies approaching the bank from many angles, as we noted in Chapter I. It is true that there have been some theoretical contributions relating to individual aspects of bank behavior and even a few attempts to develop a more comprehensive theory of the bank - in fact, the present chapter is devoted to both of these types of studies. It is also true that efforts have been made to utilize the conventional apparatus of micro-economics in discussions of banking problems, but with limited success, as Chapter III will bring out. However, there is as yet no generally-accepted theoretical framework for the analysis of the bank.

The task of this study, therefore, is not to re-evaluate a theory or certain aspects of it nor of refining and extending

an existing theory. Rather, our task is to develop a framework to facilitate the analysis of the bank firm and then to "fill in" this framework by utilizing various empirical and theoretical materials on banking. Both from the standpoint of economic theory and in view of the crucial role of the bank in our complex money economy, efforts such as the present study seem justified.

Before getting down to our main task, however, it may be well to examine the theory of bank behavior as it has developed up to the present time. In attempting to survey this literature, we are confronted at the outset with the problem of where to draw the line between theoretical contributions meriting discussion here and those which should be excluded, because obviously it is impossible to make a detailed analysis and evaluation of every contribution to our knowledge of cause-effect relationships in banking. Briefly, the line was drawn so as to include only those works or identifiable portions of works (e.g., chapters) that are (1) mainly theoretical in their approach and (2) directly oriented toward the behavior of the individual bank. The line is not always sharply defined, but the possible consequences of differences in judgement are negligible for present purposes. Excluded by the first criterion only are studies such as those in which emphasis is on bank policy, data presentation, or a particular banking problem. Excluded by the second are works on (1) monetary theory, in which emphasis in discussions of banking naturally falls on the banking <u>system</u>, (2) conventional (flow) theory of the firm, which rarely use the bank as an example, and (3) general assets

theory. The last-named approach is given some attention in Chapter IV, however, because the model of the bank developed there is a variant of the asset approach.

Contributions to bank theory may be conveniently classed, on the basis of their scope, as partial and general. In the former category are those which purport to explain only a certain aspect, or certain aspects, of bank behavior (e.g., loan policy, borrowing, dividend policy); the latter class comprises works which cover all or (by inference) the significant aspects of bank behavior. Within each of these categories, the theories are classed as deductive and inductive. The distinction between a deductive and an inductive theory lies in whether it takes as its starting point a set of assumptions, which may be "common knowledge," "generally accepted," "probably realistic," or even merely "convenient," and draws out implications from them, or whether it is based primarily on particular data.

Partial Theories

There are very few studies which properly fall in the category of "deductive partial theories," i.e., "models" of certain aspects of bank behavior. The bank is sometimes given as an example of a particular mode of behavior. Some instances are Cooper's use of the bank as an illustration of oscillatory behavior of the firm's cash and profits position[1] and Bouldings' discussion of an imperfect loan market.[2] The first of these

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[1]Cooper, op. cit., pp. 1212-1214.

[2]Kenneth E. Boulding, A Reconstruction of Economics (New York: John Wiley & Sons, Inc., 1950), pp. 130-132.

deals with the path of asset adjustment and will be discussed in Chapter IV. The second comprises a treatment of bank lending policy as an application of certain more general principles developed in a discussion of "Expectations, Gambling, and Insurance."

One bona fide piece of theoretical apparatus that fits into the category of "partial deductive theories" is the "response coefficient," developed by Shaw, which is defined as "the ratio of purchases [of earning assets] completed in any period to capacity purchases or the ratio of surplus reserves drained away to surplus reserves available."[1] Shaw discusses in considerable detail the determinants of this coefficient, i.e., (1) legal eligibility of earning assets for bank purchase, (2) the market supply of eligible earning assets, (3) competition of nonbank investors for eligible and available earning assets, and (4) the bank's own estimates of probable yields on these assets.[2] The concept of the response coefficient as applied to the individual bank is discussed in Chapter IV in connection with the timing of the asset-adjustment process.

Several inductive works are appropriately mentioned here, albeit only briefly, since each of them is discussed in the course of this study. The theory of bank borrowing, i.e.,

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[1] Shaw, op. cit., p. 131.

[2] ibid., pp. 165-183. We have substituted "earning assets" where Shaw used "securities," since Shaw defines this latter word to include loans as well as investments. "Earning assets" is the term generally used to apply to loans plus investments, while the term "securities" may carry the connotation of open-market paper.

of the determinants of commercial bank borrowing from the Federal Reserve, has been subjected to statistical investigation by Riefler, Turner, and others,[1] and will be considered in Chapter X. Several empirical investigations[2] have been made of bank liquidity preference - the relationship of some measure of interest rates to some measure of "liquidity," such as absolute or relative cash position. The reader is referred to Chapter V for a discussion of these studies and their implications.

General Theories

General theories of the bank, as the term is used here, comprise attempts to explain in rather systematic fashion the significant aspects of bank behavior - "significant," that is, within the frame of reference of economics. In practice, this usually means attempts to explain the bank's asset structure and, to a lesser extent, its liabilities structure and its size, i.e., total assets and liabilities. Again in this section we classify the theories as deductive and inductive and discuss them in that order.

Money and Banking Texts

Money and banking texts comprise the first item in this section. These works are not primarily concerned with the

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[1] See p. 252, footnote 1, for citations.

[2] A.J. Brown, "The Liquidity-Preference Schedules of the London Clearing Banks," Oxford Economic Papers, No. 1 (October, 1938), pp. 49-82; H.S. Larson, "The Liquidity Preference of Banks," Review of Economic Studies, XVIII (1950-1951), pp. 123-127; and Kjeld Philip, "A Statistical Measure of the Liquidity Preference of Private Banks," Review of Economic Studies, XVI (1949-1950), pp. 71-77.

individual bank; nevertheless, most authors of textbooks in this field[1] find it advisable to include some elementary discussion of the behavior of the individual bank. Although this sort of analysis is usually far from rigorous, it is nevertheless theoretical in that it purports to "explain," in a general way, the bank's asset structure. It is not feasible to go into all of the individual treatments of this topic, so certain generalizations will have to suffice, with the admonition that probably few, if any, of them are true of all texts consulted.

The usual approach of money and banking texts to individual bank behavior is to postulate a basic "problem" (sometimes divided into several related problems) which the management of the bank faces in choosing among various alternatives for its asset structure. With one exception[2] this problem is stated to be that of achieving a compromise between liquidity and earnings; or liquidity and solvency; or liquidity, solvency,

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[1]The ensuing discussion is based on analysis of the discussions of bank behavior in the following standard money and banking texts:

(1) Raymond P. Kent, Money and Banking (3rd. ed.; New York: Rinehart & Co., Inc., 1956), pp. 307-309, 327-330.

(2) Charles L. Prather, Money and Banking (6th ed.; Homewood, Illinois: Richard D. Irwin, Inc., 1957), Ch. XIV.

(3) Leland J. Pritchard, Money and Banking (Boston: Houghton Mifflin Co., 1958) Ch. 8.

(4) Edward S. Shaw, op. cit., Chs. VI-IX.

(5) W.H. Steiner and Eli Shapiro, Money and Banking (3rd ed.; New York: Henry Holt and Company, 1953), Ch. 9.

(6) Milton L. Stokes and Carl T. Arlt, Money, Banking and the Financial System (New York: The Ronald Press Co., 1955), pp. 219-224.

(7) Rollin G. Thomas, Our Modern Banking and Monetary System (3rd ed.; New York: Prentiss Hall, Inc., 1957), Ch. 14.

(8) Charles R. Whittlesey, Principles and Practices of Money and Banking (Rev. ed.; New York: The Macmillan Co., 1954), Ch. 8.

[2]Shaw formulates the problem in terms of yields, risks, and certain miscellaneous considerations.

and earnings; or a similar set of terms. The differences are largely terminological, however, and easily reconciled. It is not always clear or made explicit in the discussions whether this problem is or should be the primary concern of the bank. Even assuming that it is, there are certain common shortcomings which limit the usefulness of most textbook treatments of the bank firm.

In the first place, the usual concept of liquidity involves certain problems. Generally, the definition of liquidity runs in these terms: the easier is the conversion of an asset into cash and the less the likelihood of a change in its price, the more liquid it is; and the liquidity of total assets depends on the liquidity of the components. However, there are two separate criteria involved in this kind of definition; so as between two assets -- one superior in ease of liquidating and the other in likelihood of stable price -- there would be no way of deciding which is the more liquid. One cannot even postulate a marginal rate of substitution between these two qualities since they are not susceptible of objective measurement. Of course, one may argue that in practice the two qualities tend to be associated and that this way of looking at liquidity is adequate for any elementary discussion. But a definition that depends on superficiality for its acceptability is hardly firmly grounded.

A related problem has to do with the liquidity of total assets. Since liquidity cannot be measured, we cannot ascertain whether, and to what extent, a given change in asset-mix is motivated by a change in the liquidity of assets or a change in

the liquidity preference of the bank. Economic circumstances -- monetary policy, the organization of the financial markets, the phase of the business cycle, etc. -- may change the liquidity of certain assets; but these same circumstances may change liquidity preference as well.

The second shortcoming concerns the time-horizon of bankers, a problem which is bypassed generally by the text-book writers. Yet this is a matter of considerable importance to our understanding of the bank. For example, the efforts of banks to acquire and keep regular customers is evidence of a time-horizon extending beyond individual transactions, even beyond the current accounting period. Any exposition of the bank firm which fails to destroy the impression that banks focus on current earnings is, to that degree, incomplete.

Thirdly, although some authors discuss the factors on which bankers base their estimates of (say) liquidity, yield, and safety of an asset or a collection of them, others content themselves with only brief statements or omit discussion altogether. Such a discussion can be very helpful in overcoming the handicap of faulty definitions, and it assists the reader to make the connection between, on the one hand, the two or three general criteria which are supposed to guide asset-mix choices and, on the other, the complexities of the asset structure. When there is no such discussion, the whole matter tends to hang in mid-air, so to speak, with only the vaguest indication of how the asset structure is actually made up in the light of these criteria.

In the fourth place, the solution to "the" banking

problem, the problem of reconciling considerations of earnings and liquidity (or however the problem is formulated), is generally stated in terms of very broad asset-classes: reserves (primary and secondary) for liquidity, and loans and investments for earnings. This type of formulation is open to two objections. First, the wide differences between various types of loans and investments, and even individual items within a given type, are glossed over (although elsewhere in the text there is always a discussion of various types of loans and investments). Any "model," verbal or mathematical, which uses such broad categories should make very clear their "symbolic" or simplified character, lest the impression be created that in this threefold choice of assets is the crux of the banking problem and its solution. Secondly, the factors determining where the balance is struck between competing criteria are too often not spelled out.

The fifth shortcoming - fortunately not so general as the others - is this: in some discussions there seems to be the implication of a sequence involved, rather than a simultaneous determination of the asset-mix. To illustrate: "After the necessary liquidity has been provided [by primary and secondary reserves], the remainder of the bank portfolio may be arranged with an eye to solvency and earnings only."[1] This sort of statement ignores the fact that the "necessary liquidity" at the liquid end of the asset structure depends on the characteristics of the rest of the assets.

> If [the bank] has many loans of low moneyness - and especially if it has to look out for a possible shrink-

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[1] Thomas, op. cit., p. 197. Also see Robinson, op. cit., pp. 11-19; and Whittlesey, op. cit., pp. 144-145.

> age of its deposits - it needs a great deal of liquidity....A bank in this position may hold cash reserves in excess of requirements.[1]

Finally, the bank's portfolio problems having been examined, they are seldom referred to in subsequent discussions of monetary policy.[2] The individual bank becomes merely a relay station (or transformer) in the transmission of impulses from the monetary authorities.[3]

Of course, it must be borne in mind that the main objective of money and banking texts generally is to develop an understanding of the institutions involved in, and principles underlying the operation of, and the economic effects of, our monetary system. Thus, it is to be expected that the individual bank will be treated in rather summary fashion. Another mitigating factor is the absence of a conventional theoretical apparatus by which the bank's asset behavior can be analyzed in a more systematic and rigorous manner. These considerations remove some of the weight of criticism of the usual textbook treatment of the individual bank. However, there are evidences of dissatisfaction with the current status of the theory of the bank. In addition to the present dissertation, we may mention

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[1] Albert G. Hart, Money, Debt, and Economic Activity (Rev. ed.; New York: Prentice-Hall, Inc., 1953), p. 62.

[2] A conspicuous exception is Shaw, op. cit., Chs. IX-X, XIII, and XVII.

[3] It is perhaps not too much to expect that growing concern over the incidence of monetary policy will bring about some shift in emphasis from aggregate credit to the components of credit, which will involve a closer look at the processes and determinants of bank (and other financial institution) decision-making. See, for example, Herbert A. Stein, "The Financial Structure," AER (Papers and Proceedings), XLVIII (May, 1958), pp. 64-75, especially pp. 72-75.

several other recent studies of this type, those of the Alhadeffs, Scott, and Porter in the "model-building" area, and Van Tassel in the category of inductive studies.[1] These will be discussed in the following pages.

Edgeworth's "Game of Banking"

The earliest attempt at a more or less abstract treatment of the bank of which the author is aware is that of Edgeworth,[2] who thus describes his procedure:

> I have imagined a new game of chance, which is played in this manner: each player receives a disposable fund of 100 counters, part of which he may invest in securities not immediately realizable, bearing say 5 percent per ten minutes; another portion of the 100 may be held at call, bearing interest at 2 percent per ten minutes; the remainder is kept in the hands of the banker as a reserve against certain liabilities....[22 digits are drawn at random every two minutes, and the difference between their sum and their expected sum, 99, is calculated.] The special objective of the reserve above mentioned is to provide against demands which exceed that average. If the player can meet the excess of demand with the funds in hand, well; but if not he must call in part, or all, of the sum placed at call, incurring a forfeit of 10 percent of the amount called in. But if the demand is so great that he cannot even thus meet it, then he incurs an enormous forfeit...[3]

The holdings of each asset-class are determined by a kind of enlightened common sense, since "the calculus cannot

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[1] David A. & Charlotte P. Alhadeff, "An Integrated Model for Commercial Banks," Journal of Finance, XII (March, 1957), pp. 24-43; Ira O. Scott, Jr., "Monetary Policy, the Theory of Assets, and the Availability of Credit," (Unpublished Ph.D. dissertation, Harvard University, 1953), Ch. III; Richard C. Porter, "A Liquidity Theory of Bank Operations," (Unpublished Ph.D. dissertation, Yale University, 1957); and John E. Van Tassel, Jr., "An Analysis of Banking Behavior of United States Banks," (Unpublished Ph.D. dissertation, Harvard University, 1957).

[2] F.Y. Edgeworth, "The Mathematical Theory of Banking," Journal of the Royal Statistical Society, LI (March, 1888), pp. 113-127.

[3] ibid., p. 120

indeed, I think, by itself determine what chance of great disaster it might be prudent to incur for the probability of a moderate gain."[1]

This approach was not followed, apparently, nor did any other analytical system appear to be well-suited to the problem of the bank, until economic thinking began to turn to the balance sheet as a vehicle for theorizing about individual and firm behavior. A sketch of the evolution of asset theory appears in Chapter IV. The present writer frankly traces the intellectual ancestry of this study to that theoretical development; and it is probable that Scott and Porter, at least, of the writers mentioned above owe something to asset theory, since Scott cites certain works in this area and Porter's dissertation advisor was James Tobin.

In introducing the following discussion of recent general works on banking theory, the author must apologize in advance: it is not possible to present with maximum fairness and faithfulness, in a few pages, the substance of works totaling hundreds of pages. A conscientious effort has been made to capture the essential points of each work; the finer details, the explanations, and the arguments had to be left out for the most part.

The Alhadeffs' "Integrated Model"

The first of the recent studies to be discussed here is that of the Alhadeffs. Its purpose and possible uses are stated thus:

> The results of individual bank operations are summarized in the profit and loss statement for the bank; the effects of

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[1] *ibid.*, p. 121.

> bank operations on the money supply are summarized in the balance sheet of the bank, particularly the relation between liquidity reserves and deposits. It is the purpose of this paper to present a model which systematically integrates both the income statement and balance sheet aspects of commercial bank operations. The model presented in this paper is thus a very useful device for examining the probable effects of alternative bank policies, like lending versus investing, making different kinds of loans, increasing or decreasing rates on time deposits, accepting or rejecting marginal business which does not cover its full cost, the desirability of holding excess reserves, etc. In addition, the model can serve to examine the impact on the individual bank of numerous external factors, like a change in reserve requirements, internal and external drains and return flows, open market operations by the central bank, actual or prospective changes in interest-rate levels, etc.[1]

The work consists mainly of two sections: the first, a presentation and explanation of the model; the second, an illustration of its use for discussing the effects of an external factor on the bank and the banking system.

The expository device used in this paper is a "modified profit graph," an example of which is given as Figure I. Deposits plus capital are measured by DP, total fixed costs (including deposit costs net of service charges) are OD. DC represents primary (but non-excess) reserves, CP earning assets. Other types of assets and liabilities are ignored. The net revenue curve for earning assets[2] is CM, and profits are OM.

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[1] Alhadeff, loc. cit., p. 24.

[2] In their exposition, the authors first split earning assets into three categories, so that instead of line CM there is a line-segment CT, such that the distance from C to a point along the X axis directly below T measures secondary reserves and the slope of CT measures the net rate of return on them. Similarly, TZ applies to loans and ZL to investments. (ibid., pp. 30-32). The authors further suggest that "each kind of loan can be shown separately on the diagram, with line segments of different slopes for different net rates of return. Indeed, each individual loan could be shown separately." (ibid., p. 32). The Alhadeffs, however, use the type of graph presented as Figure I in all subsequent discussion.



The slope of CM is the average net rate of return on all earning assets. The time-period involved is a "moment."[1]

The exposition section is concluded with the statement that this "diagrammatic model has succeeded in integrating into one conceptual framework all important sources and uses of bank funds, as well as all important sources of income and expense."[2]

In the second major section the authors develop an arithmetical example showing how an increase in the reserves of the banking system (composed of 100 identical banks) caused by an inflow of gold and/or a decrease of money in circulation might affect the banks, via increase in the "capacity" of each bank and decline in interest rates. The effects of dropping the assumption of identical banks are then briefly discussed, as are the effects on total system reserves of certain other influences.

The authors conclude by expressing the hope "that this model will both stimulate and facilitate much needed further research into the specific impact of monetary policy on bank operations."[3]

In evaluating this article, the approach which we shall use is, first, to note the claims which the authors make in behalf of their model and, then, to assess the degree to which these claims are substantiated by them. The authors make two

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[1] "By depicting income statement items as rates per period at any moment of time, we can legitimately combine income statement items with balance sheet items." ibid., p. 26.

[2] ibid., p. 35. [3] ibid., p. 43.

specific claims for the model - (1) that it is operational[1] and (2) that it brings together the important balance-sheet and income-statement magnitudes - as well as a general claim of usefulness for depicting the effects of internal and external forces on the bank's stock and flow position.

The claim that the model brings together the important accounting variables must be granted since all important assets are actually included under the headings "reserves" and "earning assets," all important liabilities under "capacity," and all important income-statement items under "dollars per period." But in dealing in terms of such broad aggregates, the authors implicitly relegate to a position of secondary importance the many issues involving the make-up of the earning-asset portfolio. The model is operational too, in a formal sense, dealing with measurable magnitudes. Its main potentialities seem to be in depicting the effects which various internally or externally-caused events might have on (1) the size of the bank (2) average rate of return on earning assets, and (3) quantity of reserves and of earning assets, hence, the reserves-to-assets ratio;[2] but there is no discussion of factors which determine which of the possible outcomes will result.

As to the usefulness of the model, one can visualize certain possibilities for explanatory purposes; but considerable

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[1] ibid., p. 24.

[2] The reader should bear in mind that we are examining only the Figure I type diagram, not the type referred to in footnote 2, p. 29. There are serious problems connected with the use of the latter; but they will not be examined here since the Alhadeffs, although presenting that type, used only diagrams exemplified by Figure I in their exposition.

adroitness would be required, in handling the model, to deal with all the effects which an "external factor" would produce. For example, in terms of Figure I, a change in the bank's deposit-mix would change (1) OD, if there is a difference between costs of handling time deposits and those of demand deposits; (2) DC, because of differences in reserve requirements (legal and/or self-imposed); and (3) the slope of CM, if (a) the marginal earning assets have a different rate of return than the average or, (b) in addition to (a), the bank changes its earning-asset mix in response to the deposit-mix change. With or without the diagram, the final result is indeterminate. This criticism applies more forcefully in handling more complex cases, such as the effects of Federal Reserve open-market operations on the individual bank where, in addition to all the other effects, there is a possible change in size as well.

Also limiting the usefulness of the model is the fact, commented upon earlier, that it deals with broad aggregates of assets, tending to obscure the nature of the bank's portfolio problem.

Although the authors' claims in its behalf seem extravagant, this model does represent an improvement over the usual rather loose and purely verbal treatment of bank behavior found in textbooks in that it enables a number of considerations to be treated diagrammatically and, hence, more vividly. However, like most models, it must be handled carefully, in the light of its deficiencies, and it certainly is no substitute for a discussion of the <u>determinants</u> of bank behavior.

Scott's "Availability" Model

The Scott model consists of a chapter in his doctoral dissertation.[1] In this chapter the author constructs "a model which depicts the particular equilibrium theory of assets or portfolio selection implied by the availability /of credit/ argument."[2] Scott does not define "particular equilibrium," but apparently he wishes thereby to call attention to the fact that not all possible classes of assets are represented in the model since, in an explanatory footnote on the same page, he contrasts his formulation to both "general equilibrium asset theory" and an "aggregative model of the theory of assets." We have, however, included it under general theories because it evidently purports to explain the significant aspects of total behavior of financial institutions.

It should also be noted that this model claims to be of general applicability. However, since it is really a theory of financial assets, it is readily applied to the bank. Scott's whole discussion, in fact, relates to financial intermediaries, particularly commercial banks.

Although the model is in mathematical terms, here the discussion will be verbalized in the interests of economy of exposition.

The investor is assumed to have a choice between "government securities" and "private securities," both being long-term

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[1] Scott, op. cit., Chapter III, "Theoretical Underpinnings," pp. 80-93.

[2] ibid., p. 80.

only. "Cash is omitted because the financial intermediaries tend to be fully invested."[1] He has expectations as to the yields of each type. "That is, the investor is assumed to act as though he has probability beliefs concerning these /random/ variables. The expected return from the portfolio is thus a weighted sum of random variables where the weights are determined by the investor."[2]

The variance of the expected yield of the portfolio, as well as the expected yield itself, is considered relevant to the investor. Determining the variance of a given portfolio are (1) the fraction of the portfolio represented by each type of asset, (2) the standard deviation of the yields of each kind of security, and (3) the covariance of the standard deviations. The standard deviations are, in turn, influenced by market risk and credit risk. Since there is no credit risk involved in governments, it is assumed that the standard deviation of the expected yield of governments is less than that of "privates." The expected yield of governments also is considered to be lower than that of privates, on historical grounds.

Given this "information," the investing institution attempts to maximize expected returns at the highest tolerable level of risk.

> Typically, investment officers attempt to earn the highest possible return consistent with minimum safety and liquidity requirements....In terms of our model, this means there is some maximum level of V /variance/, or riskiness, which the investment officer will tolerate. This

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[1] ibid., p. 92. [2] ibid., p. 81, n. 2.

value of V_1 will thus determine the choice of a specific portfolio.[1]

One may venture serious doubts as to the validity of this view. The implication is that the investor is not at all concerned with risks relative to yields of various portfolios. A higher-risk, higher-yield portfolio is always preferred to one of lower risk and yield up to the maximum risk level.[2] This is not compatible with most opinion on the subject, which postulates some rate of substitution between "risk" and "yield."[3]

Scott then shows how the model works by a hypothetical example:

> Increased uncertainty is injected by the Federal into the government bond market. At first glance it would appear that the investor should go out of governments into private securities. However...the riskiness of the portfolio is increased by the Federal's action. In order to maintain his minimum liquidity standard, the investor must move into governments. This follows from the fact that governments are not subject to credit risk and despite increased market risk are still relatively less risky than private securities.[4]

The chapter is concluded by several comments on the model, some of which we shall consider. Scott first notes that, "as in the availability argument generally, this model

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[1] ibid., p. 88.

[2] In terms of Figure 3 , p. 91, the indifference curves implied by Scott's argument would be horizontal lines extending rightward from the Y axis to a point corresponding to a certain risk level r_o. Regardless of the position of the optimum asset curve, the investor would locate at the point where this curve touched the right end of an indifference curve. The only exception: if the optimum asset curve were horizontal over a range containing this point, there would be no unique solution.

[3] See references cited in Chapter IV, p. 89.

[4] ibid., p. 89.

abstracts from dynamic changes in expectations. That monetary policy may set off perverse movements in demand is one of the thorniest problems facing the central bank."[1] He proposes to face that issue in the final chapter. However, the gist of the discussion there is that the monetary authorities must cooperate in maintaining a steady market in governments to prevent these perverse movements in demand.[2] Secondly, the model does not allow for changes in expected yields resulting from monetary policy and, hence, the capitalization effect of monetary measures is not covered.[3] Thirdly, and recognized by Scott as "the most serious deficiency of the model," is the fact that the model omits consideration of short securities, a deficiency especially serious as applied to commercial banks.[4]

Scott does not make further use of his model. In fact, the present author failed to find a single reference to it in the remaining four chapters of the dissertation. His purpose was to present a rigorous formulation of his version of the availability argument and, in this, he succeeded. In common with most model-builders, Scott uses the short-cut of a few large asset-classes. However, this fact does not represent an actual deficiency in this case, since the general argument could be adequately presented by means of this simple

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[1] ibid., p. 91.

[2] ibid., pp. 256-259.

[3] ibid., pp. 91-93.

[4] ibid., pp. 92-93.

model and since Scott explicitly recognizes its "symbolic" nature. It is only when one attempts to apply the apparatus to particular financial institutions that problems arise, especially in reference to the commercial bank, as Scott himself realizes.

Thus, on several counts, the Scott model fails to qualify as an adequate framework for the theory of the bank: (1) omission of certain asset categories - cash and short-term securities - which are crucial to the bank and (2) a faulty (or, at least, dubious) analysis of the criteria for portfolio selection.

Porter's "Liquidity" Theory

By far the most thorough and rigorous formulation of a theory of the bank on record is that of Richard C. Porter. Although purporting to be a "partial and not a general theory of bank operations," he hopes "that the model is sufficiently general to be a useful tool for analyzing changes in bank portfolios."[1] We have included it in this section since it evidently conforms to the criteria of a general theory as the term is used herein, namely, the inclusion of all, or the significant, aspects of bank behavior.

Briefly, Porter's procedure is as follows. After brief introductory remarks (Section I), he devotes a section (II) to stating, explaining, and evaluating the assumptions to be embodied in the model. Then the mathematical model

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[1]Porter, op. cit., p. 91.

itself is presented (III), followed immediately by a "simplification" of the basic model (IV), consisting mainly of certain limitations placed upon the values of the parameters. By removing highly unlikely values, Porter eliminates the possibility of certain very unrealistic results which the model would otherwise yield. The significance of these limitations is then examined (V). The model is further altered in the following section (VI) by removing the previous assumption of pure competition in the loan market; and then the implications of the time-period of the model are spelled out (VII). In Section VIII Porter assigns a definite (plausible) value to each parameter and shows the effects on the asset structure which result from varying the value of one parameter at a time. A comparison with "actual" bank policies follows (IX), and the dissertation text is closed with some suggestions for empirical application (X). With this bird's-eye view in mind, we may discuss and attempt to evaluate some of the main points of this study.

Porter states his purpose and agenda thus:

> In this dissertation, a model is constructed of bank operations under the assumption that the principal area of uncertainty for the bank is the future level of deposits and that the bank seeks to maximize its expected (in a probability sense) profits within this uncertainty.[1]

There are actually four "areas of uncertainty" according to Porter: (1) size of future deposits, (2) market value of securities at any future moment, (3) the proportion of loans that borrowers will be able to repay, and

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[1] ibid., from "Summary" (no page number).

(4) "the degree of 'frozeness' of the loan portfolio at any moment in the future, where this degree depends upon the ability and willingness of customers to accept loan refusals."[1] In focusing upon only the first of these, Porter recognizes the possible vulnerability of his position and attempts to justify his choice:

> The number of areas of uncertainty with which we deal are /sic/ reduced on the basis of both their relative importance to the bank and their probable impact upon the portfolio. Uncertainties (2) and (3) become crucial to the bank only if it is simultaneously faced with serious deposit withdrawals..../(4) is dealt with later/ ....Thus, the essential element of uncertainty appears to be best captured in a simple model by considering only the influence of (1)...upon the bank's portfolio decision. Moreover, we are concerned with the distribution of assets into broad groups, and not at all with the distribution within these groups; and it is to this latter which uncertainties (2) and (3) appear to apply most importantly.[2]

The reader is also asked to make these assumptions: (1) the probability of loss from each loan is known and the charges varied accordingly; (2) "the bank...always acts as if it were sure that security prices will remain at their present level;"[3] (3) there is no change in earning rates on loans and investments because "we wish to avoid the myriad problems of expected, or recognition of possible gains or losses on securities;"[4] (4) the "planning period" of the bank is fixed in length; and (5) all deposits created in buying securities and making loans are withdrawn immediately from the bank at the start of the period."[5]

A definite sequence of adjustments to deposit losses is postulated and defended: (1) reduction of cash to a minimum,

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[1] ibid., p. 5. [2] ibid., p. 6. [3] ibid.
[4] ibid., p. 14. [5] ibid., p. 17.

(2) replenishment of reserves through the usual borrowing and rediscounting channels, and (3) conversion of other assets to cash, i.e., selling securities and reducing loans. This third stage involves a so-called "liquidity crisis," entailing not only money costs but also such considerations as Federal Reserve disapproval of continuous borrowing, possible FDIC investigation, loss of prestige by bank officers, etc.[1] Any net increase in deposits is assumed to be held in the form of cash over the period.[2]

The time-period of the model is described as follows:

> It is assumed that the bank concentrates all its attention onto a period of time over which it fixes, and does not plan to alter, its portfolio....While time elapses between the planning of the portfolio and the end of the period, the model is essentially static in that there is no time path of changes. At some moment in the period, depositors express their intentions to increase or decrease their deposit holdings. The bank then arranges, if necessary, the sale of the requisite amount of securities. The deposits are then changed according to the previously expressed intentions, and the bank is checked for reserve requirements. At some later time, the bank receives earnings on its holdings of earning assets, and the period comes to an end.[3]

One can readily perceive the difficulties involved in relating such a concept to the "real world." Porter is acutely conscious, almost embarrassed, over this treatment and, as mentioned above, devotes a whole section to discussing it, urging caution in its use and concluding that the "artificiality [of the model] shows up as a serious weakness if we delve too intensively into the implications of the assumptions about the planning period."[4]

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[1] ibid., pp. 11-12. [2] ibid., pp. 17, 53.

[3] ibid., pp. 12-13. [4] ibid., p. 54.

As for the goal of the bank, Porter weighs several alternatives and decides upon this: "It is assumed that the bank considers only its expected profit, and attempts to maximize this over the period."[1]

Following the discussion of the various underlying assumptions, Porter sets up his model.[2] Essentially, it is based on a three-asset (cash, loans, and investments), two-liabilities (deposits and capital) balance sheet. The problem posed is: given the initial values of the balance-sheet items and the values of various parameters (e.g., earning rates on loans and securities, minimum cash needs, etc., all expressed as percent of initial deposits), what conditions must be met in order for the bank to maximize its expected profit, i.e., maximize its increase (or minimize its decrease) in net worth over the period?

This question is then answered mathematically, in terms of "necessary and sufficient conditions" for the maximization of this variable. The solution involves the possibility of certain results highly unlikely in actuality, because of the simplicity of the model. To illustrate: because reserves are checked only at the end of the period, the bank may plan to carry insufficient (legal) reserves over most of the period. And the assumption of pure competition in loans might cause the bank to make "absurdly large quantities of loans." Both of these assumptions, however, are removed later in the discussion.

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[1] ibid., p. 17. [2] ibid., pp. 19-31.

Porter does not consider this answer complete, however. As already mentioned, the model is then refined by setting bounds to the values which the parameters may take and by dropping the assumption of a perfect loan market. In each case, the sufficiency conditions for profit maximization are reexamined.

The model is further analyzed by means of assigning a specific value to each parameter, then varying one at a time and noting the effect on the relative proportions of reserves, loans and investments. The results are illuminating within the framework of the model. However, skepticism in applying these results to "real" banks is strongly indicated; Porter himself is quite wary of suggesting such application.

In the section on "Comparison with Actual Bank Policies,"[1] Porter attempts to show that, although his model is abstract and simplified, it nevertheless yields results compatible with the record of flesh-and-blood banks. His modus operandi is to select two works on bank policy, H.S. Zarker's Conversion of Commercial Bank Funds[2] and Robinson's Management of Bank Funds,[3] and compare his model with each of them. Zarker's study is concerned with recommendations to bank policy-makers; and Robinson gives the following statement of the "basic purpose of /his/ inquiry: to describe methods of achieving the most profitable employment of commercial-banks funds consistent with

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[1] ibid., pp. 71-85.

[2] New York: Bankers Publishing Co., 1942.

[3] New York: McGraw-Hill Publishing Co., Inc., 1951.

safety."[1] Since neither of these works purports to describe bank policies in general use but rather aim to prescribe, the title of this section is not necessarily indicative of its contents.

The Zarker approach, to which Porter allots only brief discussion, advocates conversion of each liability-class into a certain combination of assets. Thus, the ultimate asset-mix will depend directly on the liability-mix. Porter finds this approach generally comparable to his own, except that Zarker is concerned more with variance between types of deposits, virtually ignoring contemplated changes in total deposits. In fact, many of Porter's parameters do not even enter Zarker's scheme, either explicitly or implicitly, e.g., rates of return on loans and investments.

Porter devotes considerable attention to Robinson's book, translating into mathematical terms some of Robinson's statements:

> Robinson's treatment covers a great deal more ground than is implied by the subsequent system of equations, and it is unfair and arbitrary to compress his necessarily unrigorous exposition into such a narrow mold. For the present purposes, however, the advantages are irresistible."[2]

By citing various statements in which Robinson offers "rules" by which the size of the various asset classes (five, in the Robinson "model") may be decided, Porter develops a determinate system of equations. Then, he compares the behavior of this

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[1] ibid., p. 4

[2] Porter, op. cit., p. 76, unnumbered footnote.

system with that of the model used in his own study and concludes: "It is true that actual bank portfolio policies, as given by the Robinson-system, are not in any basic disagreement with the rules deducible from profit-maximization assumptions."[1]

Two serious criticisms must be made concerning this conclusion. In the first place in presenting certain rules, Robinson does not profess to give "actual bank policies" but rather to show what policies a bank should follow if it wants to achieve maximum profits consistent with safety. This point was made above and applies very directly here. Porter's failure to observe this distinction results in certain misrepresentations of what Robinson meant. Porter includes certain equations in his "Robinson-System" based not on generalizations regarding bank policies but on rules, often offered half-heartedly and not intended to apply to banks generally. For example, in this "system," Class II secondary reserves are related to (1) class I secondary reserves, (2) loans, or (3) deposits.[2] What Robinson actually wrote was:

> A rule for those who want a rule. While we have discouraged the idea of a rule for the size of class II secondary reserves...there may be a few banks for which some rule should be framed. Any bank so fortunate as to have such a large loan demand that it need not go to [investments]...for full employment of its funds probably should observe some minimum rule for maintenance of secondary reserves aside from and beyond its class I needs. What should the rule be? The matter is not one for precision, but here are a few choices:...[3]

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[1] ibid., p. 85. [2] ibid., p. 81.

[3] Robinson, op. cit., p. 86.

and then follow three rules, relating this class of assets to the magnitudes listed by Porter, as mentioned above. Certainly, this is a far cry from a statement that "banks do..." thus and such!

The second criticism is that Porter does not do justice to the breadth of Robinson's discussion. Porter freely admits this, in a statement quoted above, but seems to forget it in his conclusions. What he has done is to pick statements here and there in order to build up a system of equations. He is forced to ignore certain other statements on grounds that their inclusion would cause the system to be "overdetermined." In fact, after finding enough "rules" to determine four of the five asset classes, he declares the fifth one, Class I secondary reserves, "residual,"[1] despite the fact that Robinson devotes a whole chapter to factors which the bank should consider in deciding upon the amount which it should carry in this asset-class![2]

Thus, it seems reasonable to conclude that the relationship between the Porter model and actual bank policy has not been established by Porter. In the first place, the information on "actual bank policies" is deficient, and in the second place, the "model" constructed on the basis of the information utilized is an inadequate representation of the information itself. In fact, this section really amounts to little more than playing with models. Nothing is proved as to the relationship between

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[1]Porter, op. cit., p. 81.

[2]Robinson, op. cit., Chapter 4, "Secondary Reserves: Class I," pp. 55-76.

Porter's model and actual bank policies. In fact, it is doubtful that this material even constitutes valid evidence concerning this relationship.

In the final section of his study, Porter takes up the question of possible empirical application of the model. He examines each parameter with this question in mind and comes to this rather pessimistic conclusion:

> Even from this brief treatment of the operational possibilities of the parameters, it is clear that it would be much easier to identify the factors which affect the values of the parameters than the parameters themselves. This suggests that any empirical work with the model would be very difficult, if not impossible, if we insisted on using the actual equations of the model...and that we could do much better to turn to the implications of changes as expressed in the various tables of signs and estimates of magnitudes.[1]

One might wish that Porter had taken his own cue and attempted some empirical work of the sort he suggests. However, he probably considered (and rightly so) this to be beyond the scope of a single dissertation.

The difficulties which inhere in the construction of a mathematical model are formidable, and one must admire Porter's attempt to capture the "essence" of this complex institution, the commercial bank, within the narrow confines of a small-sized system of equations. That the "practical" value of this work is not greater can, in the opinion of this author at least, be ascribed primarily to the method involved rather than to the choice of parameters or other mathematical characteristics of the model. In view of our present limited knowledge, the optimum approach to an understanding of the bank

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[1]Porter, op. cit., p. 89.

probably lies somewhere between the generalities of the purely descriptive and the narrow rigidity of the mathematical-deductive.

Van Tassel's Statistical Study

In the category of "inductive general works", only one item was found that seemed appropriate for inclusion: "An Analysis of Banking Behavior of United States Banks," by John E. Van Tassel, Jr.[1]

> The aim of this study...is to look behind the aggregate statistics published in connection with the activities of banks in the United States economy..../It/ is designed to learn new facts about banks, not in relation to particular problems, nor in relation to the aggregate effect of the banking system on the economy; but in relation to the effect of actions of individual banks on the banking system, and in relation to the reactions of individual banks to outside forces. These actions and reactions of banks constitute banking behavior in the sense used in this study.[2]

The dissertation is divided into two major Parts, each consisting of a separate statistical study. The raw material of the first Part was year-end data for a random sample (stratified by state only) of 112 commercial banks over the period 1928-1954. The second Part split all banks into two groups -- those having resources of $50 million and over in 1954 and those having a lower resources figure -- and studied each group separately, by states. A final Chapter compares the findings of the two Parts and draws certain conclusions from the study.

In both Parts, Van Tassel takes as his variables three measures of "bank behavior" and crosses them with various other characteristics of the banks and their environment, classed as (1) internal and individual, (2) external regional, and (3) ex-

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[1]Van Tassel, op. cit. [2]ibid., pp. 1-2.

ternal community. The three basic measures and the logic for their selection are explained thus by the author:

> The first measure, the rate of growth in total resources [1928-1954], is selected as an indicator of a bank's response to economic change. A bank cannot determine the course of economic change but it can react actively or passively, it can take constructive steps to meet favorable or adverse change, or it can merely accept the changing conditions. Percentage of capital to total resources, the second measure, indicates the relative safety of a bank....The individual bank is able to modify this measure to a greater extent than is possible for the first measure....Percentage of cash to total resources is the third measure selected to point out the attitude of the individual bank toward liquidity. This measure is under the direct control of a bank.[1]

One may legitimately express doubt that the three variables are valid measures of what they purport to measure. It might be argued that, in many cases, banks are rather passive in matters of growth, that a bank grows or fails to grow largely according to the fortunes of its locale (with the exception of merger, of course). Granted that it can "take constructive steps" or "merely accept," Van Tassel suggests no means for determining solely on the basis of rate of growth, which of these two responses the bank has made, and to what extent. The second, the capital-to-assets ratio, is perhaps a more nearly valid measure of "behavior," although, of course, a change in this ratio does not necessarily indicate greater or lesser safety unless one assumes a constant asset-mix -- a condition certainly not met during the period covered. Finally, a change in the reserves/assets ratio may indicate a change in "attitude...toward liquidity;" but it may also be induced by a change in one or more of the following: (1) legal reserve requirements, (2) the deposit-mix, (3) capital/deposit ratio, or (4) the earning-asset mix,

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[1] ibid., p. 8.

making a different reserve ratio appropriate even without a change in "attitude." Thus, one must be skeptical concerning statements made by Van Tassel regarding "bank behavior" because the variables used do not really measure aspects of bank behavior in any fundamental sense -- at least, the author has not established that they do.

Turning now to the statistical operations themselves, we quote from Van Tassel's description:

> In general, the analysis to be used is analysis of variance based on each of the classifications outlined [i.e., internal individual characteristics (5 measures), external regional characteristics (4), and external community characteristics (4)]...for each of the three measures in turn. It is tentatively assumed that the average value of the particular variable is the same for each of the classes under a particular classification being studied. This is equivalent to the hypothesis that there is no difference in the behavior of the banks in one class compared to the behavior of banks in the other classes.[1]

More technically:

> The specific hypothesis which we are testing is that the mean of each class [of banks] is equal to the mean of the whole population, i.e., that the differences between classes are due to chance effects of sampling, and not to real differences in the parameters of the classes. The test is based on the distribution of the ratio of two independent estimates of the variance, the variance between classes divided by the variance within classes. If this ratio exceeds the tabulated value of the so-called F ratio at a given level of probability, then the hypothesis of equal means is rejected with that degree of probability. In this study, we are using the 95% level of probability as the basis for rejecting the hypothesis.[2]

Then Van Tassel presents the results of the indicated statistical operations. Details of his findings cannot be included here, but we may quote from his summarizations. First,

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[1] ibid., p. 10. Actually, the classifications differ slightly for Part II.

[2] ibid., p. 11.

in regards to Part I:

> The first fact that stands out...is the consistency of the three external regional characteristics [geographical region; 1953 per capita state income; and growth of per capita state income, 1929-1953] in offering a probable source of explanation for the three measures of behavior.... The fact that the other types of characteristics do not offer the possibility of an explanation consistent for the three phases of behavior studied is an indication that the best explanation that can be offered by this study for the causes of variation in the behavior of banks is made up of those external economic forces which have a regional effect.... There is a significant amount of correlation between the average rate of growth of the sample banks and their average percentage of cash to total resources. There is no significant correlation between average rate of growth and average percentage of capital, nor between average percentage of cash and average percentage of capital.[1]

Then, summarizing Part II, which investigated the "behavior" of large banks as compared with small banks:

> Three of the classifications stand out as consistent explanations for differences in banking behavior:... geographic region,...states having Mutual Savings Banks, and...increase in banking resources per capita 1928-1954.... [These] classifications are interrelated...for the East is also the area where Mutual Savings Banks are found, and where banking resources are growing slowly....The obvious interpretation is that regional forces are very much felt by banks, and that their behavior is influenced by regional economic factors to an important degree....The analysis of the measures of behavior for large banks...has disclosed a sharp distinction between the large banks having resources of $50 mil. and over and the remaining banks. Moreover, it has shown that regional influences are significant in relation to the behavior of large banks as well as small banks.[2]

The "sharp distinction" between large and small banks noted in the above quotation takes the form of a considerably higher rate of growth[3] and a tendency toward a lower capital ratio[4] for large banks as compared with small banks. However, very

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[1] ibid., pp. 56, 58. [2] ibid., pp. 158, 160.

[3] ibid., p. 88. [4] ibid., pp. 113, 116.

little difference in average cash/assets ratios was noted.[1]

In his final Chapter, Van Tassel relates the findings of the two Parts, discovering them to be in substantial agreement. The specific "points of agreement" are (1) "that banks should be considered in two classes," i.e., large and small; (2) "the significance which both parts place on the regional classification;" and (3) "the absence of any other classification which delineates a consistant pattern of behavior."[2] The few minor areas of disagreement he explains in terms of characteristics of the statistical techniques used.[3]

> Aside from these minor differences, then, the two parts of the study point to the same conclusion, namely, that there are significant regional differences in the behavior patterns of banks. Even when these regional differences are set aside, there still remains a large variation in the actions of individual banks. From the study there is no indication that there is any simple set of factors which can be used to explain the large remaining variability. There is strong indication that each bank is subject to a complexity of both external and internal forces which will account for individual behavior. In addition, many of these forces are either immeasurable or unavailable to the general economic analyst, so that it is unlikely that one could arrive at a complete statistical explanation for all banking behavior. However, the study has left me with a definite impression that the method of analysis holds promise for the study of more particular phases of banking behavior.[4]

Finally, the author concludes with the observation that:

> the study seems to point to the practical conclusion that banking policy should be designed with the consideration of regional (and other) banking patterns in mind. A single nationwide policy can be expected to produce different results in some areas than in other areas. In addition, regional reactions can be expected to change as the social and economic patterns of the region are altered.[5]

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[1] ibid., pp. 135, 138. [2] ibid., pp. 167-168.

[3] ibid., pp. 168-169. [4] ibid., p. 169.

[5] ibid., p. 172.

Viewing the study as a whole, it is evident that Van Tassel has indeed discovered "new facts about banks," as he set out to do. He has put his finger on a real gap in our banking information, namely, data concerning the individual bank. But it is not evident that he successfully relates these new facts to "the effect of actions of individual banks on the banking system" nor "the reactions of individual banks to outside forces." His analysis simply does not yield this kind of information. His statistical techniques are legitimate, but in interpreting the results he is less careful than he should have been.

CHAPTER III

THE BANK FIRM AND CONVENTIONAL MICROECONOMIC THEORY

Before the actual exposition of our theory of the bank firm, it will be instructive to consider a possible objection to the whole idea of developing such a theory, namely, that the bank firm can be adequately analyzed within the framework of the conventional theory of the firm. To demonstrate the inadequacy of the flow theory of the firm as applied to the bank firm, we first briefly summarize the main points of the accepted doctrine and then call attention to its shortcomings as applied to banks and similar firms. This discussion will have to be extremely brief and will, therefore, not do justice to the fine points nor to the recent developments in the theory of the firm, nor to the various shortcomings that have been noted. However, we hope to make clear that refinements of the theory will not fit it for analysis of the bank, because it is the framework - the approach - itself which is unsuitable.

The Conventional Theory

In economic theory a firm is simply an economic entity which produces one or more commodities and services. Its goal is the maximization of profits, a flow variable which is the difference between revenues (sales receipts) and costs, both of these latter being treated as functions of the rate of output. The profit-maximization problem thus becomes the problem of

finding that rate of output per unit of time that maximizes the difference between revenue and costs when the former is larger, or minimizes the difference when the latter is the larger. Stated another way, the problem is to find the rate of output such that $\frac{dC}{dQ} = \frac{dR}{dQ}$ and $\frac{d^2C}{dQ^2} > \frac{d^2R}{dQ^2}$ where C represents costs, R revenue, and Q output.

The costs of producing a specified output are not simply "given" to the firm. Rather, the firm is assumed to attempt to utilize available resources in such a combination that the cost of producing this output is minimized; and this same practice will be true of all possible outputs. Certain resources may be fixed in amount over a certain period, in which case the problem is that of utilizing the variable resources - e.g., different types and amounts of labor, circulating capital, and raw materials - in the least costly manner, for each possible output. If a period of time long enough to permit the firm to adjust the amounts of all resources is considered, the problem is not essentially changed.

Application of Conventional Theory

There have been a number of instances in which the above framework has been used, albeit somewhat casually, in discussions of banks and the market structure of banking. For example, banking has often been called a decreasing-cost industry. Alhadeff discusses the "average cost (ATUC) of production per $100 of output [of loans],[1] and a kinked demand

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[1] David A. Alhadeff, Monopoly and Competition in Banking (Berkeley: University of California Press, 1954), p. 87.

schedule for loans facing the individual bank.[1] Yntema refers to the fact that "the elasticity of demand for the services of particular lender [to consumers] is low."[2] As might be expected, the traditional theoretical apparatus is applied to banking firms mostly in connection with pricing matters - bank price policy and its determinants - and occasionally with the problems of credit availability and bank tax incidence.[3]

These and other references in banking discussions to concepts familiar in general microeconomic theory invite inquiry as to how applicable the traditional apparatus is to analysis of the banking firm. Is there an "average cost per $100 of loans" that can be discussed without ambiguity, or a "consumer loan demand curve facing the single bank" that can be understood and analyzed without confusion of meaning? These questions are part of the broader question of whether the bank firm can actually be integrated into the usual theory of the firm without doing violence either to the concept of the bank or to theory. To the author's knowledge, there has never been any systematic treatment of the bank firm along these lines.[4] The following analysis will point up the difficulties in the path of such an integration.

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[1] ibid., p. 170.

[2] Theodore O. Yntema, "The Market for Consumer Credit: a Case in 'Imperfect Competition'," Annals of the American Academy of Political and Social Science, CXCVI (March, 1938), p. 83.

[3] For examples: Kimmel, op. cit., ch. 5, and J.B. Woosley, State Taxation of Banks (Chapel Hill: University of North Carolina Press, 1935), chs. 3-8.

[4] The closest approximation seems to be the Alhadeffs' model, discussed in Chapter II.

The Bank in the "Flow"-Theory Framework

Since the firm is usually analyzed in terms of a set of curves describing functional relationships between cost and output and between revenue and output, the first step toward fitting the bank firm into this framework must be to define these terms with reference to the bank. The output of the bank is usually understood and stated to be loans and investments, and we speak of markets for these classes of items and their various divisions. Yet these same items are also the principal assets of the bank. This dual use of loans and investments - as output and as assets - may not cause serious confusion; but for clarity of analysis and to bring out the "flow" idea, it is advisable to distinguish earning assets from the service of the use of money, or simply money-service.[1] The former are stock items; the latter, a flow item. Since flow magnitudes must be measured on a per-unit-of-time basis, we may measure money-service in terms of dollars per day, for example, just as electricity is measured in kilowatts per hour. This, then, is the nature of the output of the bank. Costs and revenues must be related to output as thus defined; and the functional relationships of costs and of revenue - average, marginal, and total, in both cases - to output can then be graphed in the usual manner.

To start with as simple a situation as possible, assume a bank whose only earning assets are a collection of $1,000 discounted notes, completely secured, entirely uniform as to

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[1] Cf. a similar concept used by Yntema in the article cited above: "In the case of consumer credit, the commodity is the use of money or capital." (p. 79).

terms (rate of discount, length of time the notes are to run, scheme of repayment, etc., as well as the amount itself) and identical as to riskiness and desirability, from both short-range (single-transaction) and long-range (customer relationship viewpoints.[1] The bank, in other words, has no reason to prefer one borrower over another. The bank is assumed to sell its money-service in a perfect market. Deposits also are assumed to be identical in all relevant respects; but no attention is paid to the structure of the market for deposits at this point.

The short-run AC curve of our prototype bank will probably be downward-sloping over a considerable range, reflecting the spreading of the rather substantial overhead, then rising as the restrictions imposed by fixed plant take effect. In the long run, too, banks seem to be characterized by decreasing costs over a very wide range of sizes, although available data and analyses are not without ambiguities, as will be seen in Chapter XI.

There is a complication which must be faced before cost schedules can be discussed meaningfully - the fact that costs associated with a given money-service arrangement (manifested on the bank balance sheet in the form of an earning asset) do not cease once the earning asset is purchased by the bank. This calls attention to the importance of treating earning assets not as products but as contracts for money-service. In connection

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[1]The assumption of a single product is not crucial but is introduced for simplicity of exposition.

with a given loan, for instance, there are three different categories of costs. First, there are costs of making the loan - expense associated with credit investigation, negotiation, etc. Second, the bank incurs the costs of carrying the loan - supervision or other servicing costs. Finally, there are the costs of collecting the loan and otherwise terminating the transaction. These same general classes of costs apply in the case of bank investments as well. The marginal cost of a loan can thus be analyzed as the marginal cost of making, carrying, and closing the arrangement for money-service between bank and borrower. It is only in the extreme case in which loans are identical in all respects that all three types of costs for each loan are identical at the margin.

The Average Revenue and Marginal Revenue curves coincide and are horizontal, i.e., parallel to the X axis, since the bank is assumed to sell in a perfect money-service market. The profit-maximizing output, for which the bank is assumed to be striving, is that at which the marginal cost and marginal revenue curves intersect, i.e., where the cost of furnishing additional money-service equals the addition to total revenue resulting therefrom.

Evaluation

Although we thus have a formal solution applicable to bank-type firms as well as to ordinary business firms, the simplifying assumptions that made this solution possible certainly cause our model bank firm to differ drastically from the actual flesh-and-blood bank. The problem to be considered now

is the extent to which these assumptions can be dropped in an effort more closely to approximate reality, while still retaining the validity of this approach as a vehicle for the study of the behavior of the bank. Each assumption will be discussed separately; then, finally, the implications of dropping all of the assumptions will be examined.

The first assumption, that banks attempt to maximize short-run profits, requires some discussion. This assumption has been widely criticized on several grounds as applied to firms in general. Boulding, for example, suggests that perhaps firms maximize utility, as determined by both profits and size.[1] The same author also shows that, where there has been a change in the price of a firm's output during a given accounting period, "the 'marginal cost equals marginal revenue' condition of the elementary analysis yields a determinate solution only because of the limiting condition that the whole output must be sold."[2] That is to say, profit maximization in the sense of maximizing increase in net worth during a period might dictate selling none of the output of the period or, presumably, more than total output, i.e., by drawing down inventories, or any alternative between. Also a number of writers are emphasizing the role of uncertainty and consequent desire for liquid assets as a factor causing the firm to deviate from that output that would maximize

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[1]Kenneth E. Boulding, "The Incidence of a Profits Tax," AER, XXXIV (September, 1944), pp. 567-572. Also cf. Tibor Scitovsky, "A Note on Profit Maximization and Its Implications," Review of Economic Studies, XI (1943), pp. 57-60.

[2]Boulding, A Reconstruction of Economics, p. 101.

expected short-run profits.[1] And Rothschild claims that "there is another motive...which is probably of a similar order of magnitude as the desire for maximum profits: the desire for secure profits."[2]

The assumption of short-run profit-maximizing behavior as applied to ordinary business firms is often defended, however, on the grounds that, although it is not completely valid, conclusions yielded by the conventional theory of the firm are sufficiently useful to justify its retention. In the case of the bank firm, however, the importance of liquidity considerations is held to be so great as to forbid the application of the usual theory. For example, McKean gives several reasons for separate consideration of banks and nonbank firms, among which is the fact that "banks carry much larger cash reserves (i.e., are probably influenced to a much greater degree by liquidity position) than other businesses."[3] However, it is important to note that to hold that bank firms stress liquidity more than nonbank firms is not tantamount to showing that the former have different goals than the latter. In an attempt to

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[1]A few examples are William Fellner, Competition among the Few (New York: Alfred A. Knopf, Inc., 1949), Ch. 5; Albert G. Hart, op. cit., p. 63; and Kenneth E. Boulding, Economic Analysis (3rd Ed.; New York: Harper & Bros., 1955), pp. 557-558. See Andreas G. Papandreou, "Some Basic Problems in the Theory of the Firm," Survey of Contemporary Economics, II, ed. by Bernard F. Haley (Chicago: Richard D. Irwin, Inc., 1952), pp. 183-219 for discussion of profit maximization and references to recent literature.

[2]K.W. Rothschild, "Price Theory and Oligopoly," EJ, LVII (1947), reprinted in G.J. Stigler and K.E. Boulding (eds.) Readings in Price Theory (Chicago: R.D. Irwin, Inc., 1952), p. 450 of the latter.

[3]Roland N. McKean, "Liquidity and a National Balance Sheet," JPE, LVII (December, 1949), p. 511.

salvage profit-maximization as applied to banks, G.P. Martin asserts:

> Both the management of the specific firm called the commercial bank and the management of the general "representative firm" attempt to achieve the optimum probability distribution of profits in the light of expectations of future events which are "uncertain." For the seller of financial services this means that the volume of output is not a simple function of interest and service charges. The management of the typical commercial bank is more concerned with liquidity than the management of the non-bank firm because the bank's chief source of funds is the demand deposit...The stress upon liquidity by a bank's management does not represent a different profit maximization "marginalism" from that of a non-bank firm's management.[1]

What Martin is stating is that firms of both types, bank and non-bank, take liquidity position into consideration but only as a means to profit maximization. It can also be argued, however, that liquidity is a desirable thing in itself. The accompanying diagram (Figure 2) illustrates this hypothesis and presents certain conclusions which follow from it.[2] The ratio of expected (i.e., modal) profits to capital is measured vertically; the reserves/assets ratio horizontally. The earning-asset mix is assumed to be adjusted to yield maximum utility, subject to any constraints that may exist, such as a legal reserve requirement. Curve RR^1 depicts the hypothetical functional relationship between the level of earnings and the reserves-to-assets ratio. As this ratio increases from zero level, expected profits rise rapidly, the likelihood of

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[1]George P. Martin, op. cit., pp. 174-175. Also cf. Harold M. Somers, "Monetary Policy and the Theory of Interest," QJE, LV (May, 1941), p. 496.

[2]The following is similar to a treatment by T. Scitovsky, op. cit.

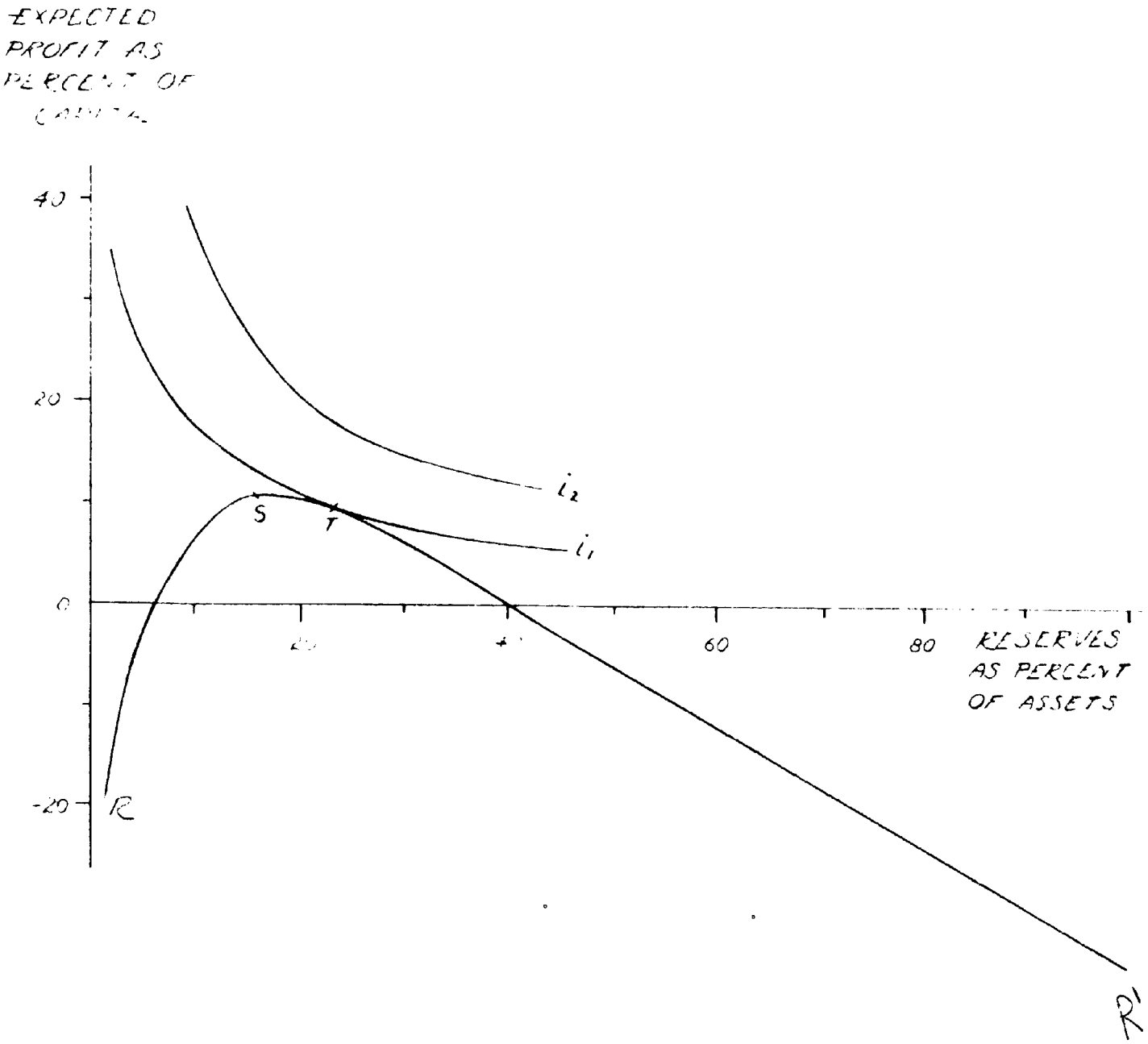


Fig. 2.--[illegible] curve ratio and the rate of profit

incurring the unfavorable effects of insufficient liquidity being lessened as the "safety margin" of reserves increases. This effect at first outweighs the downward pressure on profits from a decreased earning-asset base, but the potency of added dollars of reserves in creating the improved expectation of profits rapidly diminishes and begins to be outweighed by the countereffect of fewer earning assets. In our figure, these two influences are of equal force at point S.

Indifference curves i_1, i_2, etc., are drawn to embody three properties: (1) they are convex with respect to the origin, indicating that both magnitudes are desirable and subject to diminishing marginal utility; (2) given the degree of "liquidity" (i.e., reserves/assets ratio), the higher the indifference curve attained (i.e., the greater the earnings rate), the steeper the slope of the curve at that level of liquidity, signifying that, the greater the rate of profit, given liquidity, the more profit the bank is willing to forego in exchange for a given increase in reserves; (3) given the rate of profits, the higher the indifference curve attained (i.e., the higher the reserves/assets ratio), the shallower is the slope at that rate of profits, indicating that, the higher the reserves-to-assets ratio, given profits, the more liquidity the bank is willing to forego in order to achieve a given increase in profits.

If the bank were completely indifferent to profits, the indifference curves would be vertical, rising in value from left to right and the bank would achieve equilibrium at 100% liquidity. If, on the other hand, the bank were completely indifferent

to liquidity as a "good" in itself, as Martin seems to imply, the indifference curves would be horizontal, rising in value away from the X axis, and the bank would achieve equilibrium at point S, denoting maximum expected profits. To the extent that both magnitudes are desired, it must be concluded that the bank will desire to maintain a more liquid position than profit considerations alone would dictate. In Figure 2, this equilibrium point is T, which represents a lower earnings rate and a higher reserves/assets ratio than that represented by the point of profit-maximization, point S.

Support for this view is given in this quotation from Fellner:

> There exists a presumption that the possibility of unfavorable surprise is typically weighted more heavily than that of favorable surprise...The adverse consequences of business losses tend to be cumulative at a rate which usually has no equivalent counterpart on the favorable side...In environments in which extraordinary gains... are very unlikely, and in which the quasi-objective likelihood of moderate favorable deviation [from the "best guess" outcome] is no greater than that of moderate unfavorable deviation, the quasi-objective factors justify a greater emphasis on the possibility of unfavorable surprise.[1]

Thus, the marginal dollars of reserves may not be converted to earning assets, even though this would be expected to yield a positive return, because of higher subjective valuation of unfavorable deviation than of equivalent favorable deviation; and, if this is the case, a higher reserves/assets ratio than that indicated by profit-maximization considerations will result, as depicted in the diagram.

In so far as nonbank firms, too, regard liquidity as

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[1]Fellner, op. cit., p. 149.

desirable in itself, apart from its effect on profitability prospects, the above analysis will be applicable to those firms as well as to banks, with some modification of terminology. Note, however, that this analysis differs from that of Martin, who holds that liquidity is desired by banks and nonbanks to the degree that it improves profit prospects. While recognizing the partial validity of this position, our analysis goes somewhat farther in treating liquidity as having desirability in and of itself.

Regardless of the seriousness of the criticism that liquidity matters are neglected in the traditional theory of the firm as applied to the nonbank firm (a subject beyond the scope of this study), there can be no doubt that this consideration reduces greatly the usefulness of the usual microeconomic apparatus in discussing bank behavior.

Another criticism of the profit-maximization assumption as applied to the bank firm is that banks do not set their prices (interest rates on loans) with regard to their costs. In some cases it appears that banks should charge a far higher price for particular types of money-services, e.g., small loans to small customers; and in other cases it appears that bank interest rates may be too high for profit maximization. One reason why prices are not always closely related to costs in banking is found in the rather underdeveloped state of cost accounting in banking. McKenzie observed:

> When compared with industry, the banks of the country are mere novices at cost control. Only in the last 10 or 15 years [before 1944] have the major banks of the country developed methods which were adequate to the need. Without

> question, cost control is only a subject of conversation among a very substantial portion of the moderate size and small banks of the country.[1]

A further reason for cost-price discrepancies is found in the fact that, with oligopoly characterizing many bank-firm market situations, the demand curve for a given type of money-service, as seen by the single bank, may be kinked.

> When country banks occupy an oligopoly position in the loan market, the price of customer loans is stabilized (...at the customary or fair price) by a recognition by the oligopolists of their mutual dependence, or, in certain instances, by outright collusion in the form of informal agreements and understandings. At the stabilized price thus achieved, each of the oligopolists faces a kink in his demand schedule...Only the most severe changes in... cost...can escape the discontinuity of the marginal revenue curve and actually influence customer loan rates.[2]

It is doubtful that the criticism that pricing does not conform closely to cost conditions is more applicable to bank firms than to many other types of firms. That is, there appear to be many situations in which various "rule of thumb" pricing arrangements are used simply because the costs of actually ascertaining cost and revenue functions reasonably well would be prohibitive and would result in an extremely complicated price structure. For example, strict adherence to the MR=MC principle would mean one price per gallon of

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[1] W.M. McKenzie, "Controlling Bank Costs," NACA Bulletin, XXVI (September 15, 1944), p. 39. Also see Alhadeff, op. cit., pp. 119-120, and R.B. Westerfield, op. cit., p. 285. The last-named source contains these reasons for this tardy development: (1) cost analysis often does not appear to be an economically sound expenditure; (2) banks often feel that small, costly accounts are likely to grow into profitable ones in time, or they may be instrumental in getting or keeping other, profitable accounts; and (3) banking is considered so complex that costs cannot be allocated with any degree of precision among departments and customers.

[2] Alhadeff, op. cit., p. 170.

gasoline to the purchaser of five gallons and another price to the purchaser of fifteen. Also, there would be a charge for checking tires, cleaning windshield, use of washrooms, "free air," etc. Plainly, such a system would not work.

A third cause for deviation from profit-maximizing behavior is the time-lag in the bank's response to changing market conditions. Loan rates are administered prices; they do not respond automatically to changes in the market environment. Rather than immediately raising (lowering) the rate schedule in response to a tightening (easing) of monetary conditions, the bank may act quite rationally in allocating loan funds at least temporarily on a basis other than via the price mechanism, holding a "wait and see" attitude with respect to interest rates. In this regard, too, bank behavior does not appear to differ significantly from that of ordinary business firms.[1]

Tradition and custom with respect to loan rates constitutes another reason why the bank's price-output policy may deviate from that appropriate to profit maximization. Factors involved here are: inertia on the part of bankers, a belief that the confusion and cost generated by frequent changes in rates do not justify adoption of this policy, and the fact that "once a rate has been established for particular categories of small loans, that rate acquires the aura of 'customary, fair and just price.'"[2]

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[1]See Chapter VI and references cited therein for a more detailed discussion of this phenomenon.

[2]Alhadeff, op. cit., p. 121.

To summarize: the usual assumption of profit-maximizing behavior, represented by the equating of marginal cost and marginal revenue, is not applicable to any significant degree to the bank firm. In the first place, due to the dominance of demand and very short-term liabilities, liquidity considerations are far more important for banks than for nonbank firms generally. Second, and applicable to nonbanks as well as banks, is the failure to relate prices to costs due to (1) the difficulties of ascertaining marginal cost and marginal revenue and of applying this rule because of the complexity of the price structure that would result and (2) the existence of oligopoly situations making for price rigidity. The third reason is the failure of banks promptly to adjust prices to conditions of changing demand; and the fourth is the importance of custom and tradition in determining loan rates.

It will be recalled that we assumed all earning assets of this "model" bank to be identical. Certainly, this is remote from reality. Differences exist among earning assets as to riskiness, size, duration of time until maturity, marketability, collateral, desirability from the standpoint of long-term customer relationships, and other characteristics. Thus, the conclusion is inescapable that there is no real supply curve of, or demand curve for, earning assets in general because there is no homogeneous "product" called an "earning asset." Expressed differently, there is a demand for money-service in the forms of various types of loans and investments, but there are no marginal, average, or total cost curves, in the usual sense, of providing money-service because the conditions

surrounding each transaction differ from those of other transactions.

It is not even certain that it would be possible to classify loans in some useful manner. McKean is quite pessimistic regarding such a possibility:

> In a single market for a homogeneous commodity, sellers do not prefer one customer to another, and price tends to equate quantity demanded and quantity offered. In the loan market, however, sellers (i.e., lenders) classify their customers according to the risk of losing principal and interest payments, and no single interest rate moves so as to equate the quantities offered and demanded. If customers fell into discrete compartments or risk categories, this would simply mean that several loan markets and interest rates existed. But even within a single broad risk-category, each borrower presents a different degree of risk; and a loan to one customer is a different commodity from a loan to another.[1]

It may be thought that the cost curve concept may be salvaged by concentrating attention on the "carrying costs" of providing money-service, neglecting the fact that the arrangements under which this service is provided vary widely. This expedient would be similar to the manner in which the business firm is generally treated in economic theory. In drawing up a cost schedule of a firm, no consideration is given to the fact that "orders" of different sizes involve different per-unit handling costs, in the plant and in the office, or that a shipment sent to firm X may involve different risk than one sent to firm Y. In similar manner, our discussion of the bank firm may ignore cost differentials associated with different size-mixes and duration-mixes of earning assets and the fact that they may differ in riskiness. We simply assume that

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[1] R.N. McKean, op. cit., pp. 506-507.

differential charges will be levied by the bank, just as quantity discounts, quotation of different terms to customers according to relative riskiness of granting credit and their relative desirability as customers, etc., are practices of business firms.

Thus cost curves relating the amounts of money services performed to average and marginal costs of performing such services might conceivably be drawn. Included as cost items would be the usual ones - fixed costs, normal return to owners, and the like - plus the cost of the main "raw material": deposits. These costs comprise interest paid (including any offset against service charges on demand deposits based on average or minimum balance) and any free services performed in connection with deposits. Cost curves thus drawn would probably be of only slight practical use, however, due to the fact that, for bank firms, the common element in all earning assets - the furnishing of money-service - is completely overshadowed by the differences in conditions and terms under which such service is performed.

It is not necessary to elaborate on the implications of the removal of the assumption that deposits are uniform in relevant characteristics. As in the case of earning assets, dropping the uniformity assumption destroys the apparent neatness of the cost-output relationship; but it does not follow that the relation between deposit interest rate and amount of deposits is completely random and erratic. As will be discussed in Chapter X, the evidence is quite the contrary.

The assumption of a perfect market for money-service is

also clearly unrealistic. Rather, if money-service is thought of as the bank's product, this product can be considered as marketed in a variety of settings, ranging from pure competition to monopoly, with many types of customers, and carrying a variety of terms of sale and other provisions, so that the "package" is actually differentiated and the bank finds it possible to practice what amounts to price discrimination. The problem of the bank, in terms of the orthodox theoretical apparatus, is the allocation of its output among various markets, in various "packages," in order that MR=MC in all of the markets.

The final assumption to be removed is an implicit one: that the cost functions and demand function are independent. It is taken for granted - though seldom, if ever, stated - in expositions of the theoretical apparatus of traditional microeconomics that, if the firm moves to a different point on its demand curve, the cost curves remain unaffected.[1] This assumption is not entirely valid in the case of the bank firm. If a bank were to reduce its loan "price," thus inducing increased purchases of money-service, one result would likely be an increase in deposits. This increase in deposits (supply of money-service to the bank) without a change in deposit interest rates is equivalent to a rightward shift of the supply curve of money-service, which is the largest cost item for most banks. It is thus evident that cost and demand curves are not completely independent under these circumstances. The practical importance

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[1] If all, or many, firms in a multi-firm industry were to do the same thing, the result might be a shift in the cost curves of the conponent firms.

of this condition will depend on the character of the banking system, being greater for those systems characterized by a few large multi-outlet systems than for systems such as ours, dominated by unit banks and banks with branches covering only limited areas.

Conclusions

Now that each of these assumptions has been examined individually, it remains to determine what, if anything, can be salvaged out of the conventional theory of the firm that will be applicable to the bank, and to ascertain the usefulness of this residue in analyzing problems of bank behavior.

First, the basic postulate of the traditional theory of the firm, that of profit maximization, is of limited validity as applied to the bank firm because of the difficulties and tardy development of bank cost accounting, the impracticability of any pricing schedule based on an attempt to relate prices closely to costs, the importance of noneconomic considerations in banking, and the crucial role of liquidity considerations. Second, it has been shown that there exists no definite cost schedules for bank firms simply relating, say, average cost to level of output, because there are so many forms of transactions in which money-services can be arranged for. Adapting the cost-curve device to the bank firm is possible, but the result does not appear useful due to the fact that so many crucial elements determining bank behavior must be left out. Third, differences in size, liquidity, and cost (to the bank) of deposits also contribute to the difficulty of drawing

up precise cost functions. Fourth, the dropping of the assumption of a perfect market for money-service causes no serious analytical trouble. Finally, we observed the dependence of bank cost functions (defined loosely, to indicate the relation of costs to the size of an output of given earning-asset mix) on the demand function, such that there will be a different cost-output relationship for each point on the demand curve (using the term loosely) for money-services.

In view of all of these shortcomings, it is evident that considerable caution must be exercised in applying customary microeconomic concepts to problems of the bank firm. Although sometimes handy as expository devices, these concepts as applied to the bank do not stand up well under searching scrutiny and have not proved generally useful in discussion of bank policies and problems.

CHAPTER IV

AN ELEMENTARY MODEL OF BANK ASSET-STRUCTURE DETERMINATION

In the light of the foregoing chapter, it is not difficult to understand why analyses of the bank firm have not used widely and systematically the tools and terminology of the conventional theory of the firm. What is difficult to understand, however, is the fact that no substitute analytical framework has emerged. In this study it is proposed to build a theory of the bank firm mainly in terms of stock (balance sheet) variables. There appear to be several good reasons for doing so. First, there is the negatively-expressed reason that it does not seem feasible to analyze bank behavior in flow terms, as noted. Second, bank firms are almost always discussed in balance-sheet terms, both in theoretical writings and in practical banking literature. Third, some of the principal exceptions to profit-maximizing behavior are really attributes of assets and liabilities (obvious examples are liquidity and safety considerations); thus, a balance-sheet framework seems to lend itself to a broader, more realistic, analysis of economic behavior. Fourth, abundant statistical data exist, in terms of balance-sheet magnitudes, in the area of banking, some of which are of use in suggesting generalizations and verifying hypotheses. Finally, there have been many advances in economic theory in recent years in so-called "asset theory",

which not only will enable a theory of the bank to be developed with less difficulty but also call for an attempt to apply some of the principles and generalizations worked out in this field to a specific setting.

It may be feared that, with balance-sheet magnitudes as its basis, this analysis will neglect flows. The contrary is true: flows will be emphasized. In fact, they must be emphasized because the major reason for holding a particular collection of assets and liabilities of a particular total value is found in the expected flows associated with them and in the timing of these flows. Evidence of this emphasis on flows is found in the titles and contents of subsequent chapters.

The present chapter contains the elements of a framework to aid in the analysis of the behavior of the bank's asset structure. In the following five chapters the determinants of the bank asset-mix are examined under the headings of yield, risk, cost, and the pertinent activities of government not conveniently treated under these three headings. In discussing in some detail these important factors, we move to a lower level of abstraction. The purposes in so doing are twofold. First, the theory is given more content when the influences of the determinants of yield risk, and cost are shown in detail. Second, data and results of investigations can be brought to bear on the theoretical conclusions more easily when the theory is extended downward to a less abstract plane.

Outline of Asset Theory

Before an exposition of the model, it seems advisable

to sketch briefly the development and nature of the balance-sheet approach to economic theory, since the present work is intellectually related to it. Asset theory (the descriptive name we shall use for this general branch of economic theory) seeks to use balance-sheet variables rather than income-statement variables as the main vehicle for economic analysis, both macro- and microeconomic. It uses such terms as "asset preference," "rate of transformation of assets," "debt structure," etc., rather than the traditional vocabulary of costs, revenues, demand, and the like. Although these latter variables are taken into account, this is done implicitly, just as asset and liability factors are often brought in through the back door, so to speak, in dealing with the firm's behavior, using the traditional concepts.

Development of Microeconomic Asset Theory

Toward an understanding of this approach as applied to microeconomics, it might be helpful to sketch its development. This topic has not been systematically surveyed, so far as this author is aware, and the ensuing paragraphs hardly comprise a substitute for such a survey; but at least they will call attention to some of the origins of the asset approach to microeconomics.

There have been at least three sources of development of microeconomic asset theory: liquidity theory, investment theory, and the desire for a more adequate vehicle for the analysis of the firm. The development of the first of these can be traced at least as far back as Henry Thornton, who

alluded to the influence of non-monetary liquid assets in spending decisions.[1] However, systematic analysis of the noncash items in the balance sheet was not undertaken until the 1930's. Probably the first to develop the idea that the whole balance sheet is simultaneously determined was John Hicks. He took his cue from material in Keynes' Treatise which "shows that /the/ price level /of investment goods/ depends upon the relative preference of the investor to hold bank-deposits or to hold securities" and "that the relative preference ...depends upon the 'bearishness' or 'bullishness' of the public, upon their relative desire for liquidity and profit."[2] Hicks states that the proper starting-point in constructing the theory of money is to "take the position of an individual at a particular point in time, and enquire what determines the precise quantity of money which he will desire to hold...We have to concentrate on the forces which make assets and liabilities what they are."[3]

Another pioneer theoretical contribution was that of Makower and Marschak, who stated the purpose of their "Assets, Prices and Monetary Theory" in these words: "In order to understand what determines peoples' cash holdings and the prices of goods in terms of cash, we have to discuss more generally the

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[1]Henry Thornton, An Enquiry into the Nature and Effects of the Paper Credit of Great Britain (London, 1902), pp. 39-43; cited by McKean, op. cit., p. 508.

[2]John R. Hicks, "A Suggestion for Simplifying the Theory of Money," Economica (N.S.), II (1935), pp. 3-4.

[3]ibid., pp. 16, 25. Underlining added.

causes making people hold idle stocks - of which cash balances are a particular case."[1]

Also appearing in 1938 was a statistical study by A.J. Brown, reflecting essentially the same point of view. Although purporting to be "an attempt to see if the 'liquidity-preference schedule,' which Mr. Keynes has introduced into the theoretical discussion, can be used...as an instrument of statistical analysis," his method of going at the problem was hardly pure Keynes. He proposed "to investigate the way in which the London Clearing Banks have changed their holdings of different kinds of assets as the relative yields of those assets have varied during the post-war period."[2]

A second strand in the development of microeconomic asset theory was investment theory. In attempting to develop meaningful aggregative models, an understanding of the individual investing unit, the firm, was found necessary. The traditional "flow" apparatus of microeconomics was seen to be inadequate as a framework for discussing investment, which is essentially a balance-sheet phenomenon, so again attention was focussed on balance-sheet variables, by such writers as Hart, Kalecki, Domar and Musgrave, McKean, and Jones.[3]

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[1] Helen Makower and Jacob Marschak, "Assets, Prices and Monetary Theory," Economica (N.S.), V (August, 1938), p. 261.

[2] A.J. Brown, op. cit., p. 49. Underlining added.

[3] Albert G. Hart, "Assets, Liquidity, and Investment," AER (Papers and Proceedings), XXXIX (May, 1949), pp. 171-181; Michael Kalecki, "Principle of Increasing Risk," Economica (NS), IV (1937), pp. 440-447; Evsey D. Domar and Richard A. Musgrave, "Proportional Income Taxation and Risk-Taking," QJE, LVIII (May, 1944), pp. 388-422; McKean, op. cit.; and Homer Jones, "Investment Prospects," Journal of Finance, II (April, 1947), pp. 15-33.

The third source of asset theory was largely negative in character. Various empirical studies of business behavior, as well as some conclusions reached by theorists, pointed up the inadequacy of the assumption that profit-maximization, as usually understood, is the goal of business endeavor. Inadequacy of the existing framework for analyzing the firm might be expected to stimulate, and has stimulated, attempts to develop a more adequate analytical framework.[1] It would be premature to venture an opinion as to whether any of these will attain general acceptance.

Essentials of Asset Theory

This branch of economic theory is still very much in a state of becoming. There is no generally accepted terminology or set of definitions of concepts, nor even a standard name for the theoretical approach itself. The following attempt to set down the essentials of this theory is therefore undertaken with some trepidation.

The firm is looked upon primarily as holder of a collection of assets, against which are held liabilities (negative assets). It is expected to attempt to adjust the composition and size of its balance sheet so as to move in the direction of some most-preferred position. Although this position is sometimes defined with reference to assets (positive type) only, clearly the most-preferred balance sheet must be considered with reference to both sides. Equilibrium exists - the most-preferred position is attained - when three require-

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[1] e.g., Boulding, A Reconstruction of Economics; and Cooper, op. cit.

ments are met. First, the ratios of the marginal utility of each positive asset to its marginal price must be equal. Marginal utility may be considered primarily, but not necessarily exclusively, dependent on marginal yield and marginal risk. The second equilibrium requirement is that the ratios of the marginal disutility of each liability to its marginal price must be equal. Finally, the ratio of the marginal utility of each asset to its marginal price must be equal (neglecting signs) to the ratio of the marginal disutility of each liability to its marginal price.

If the first requirement is not met, there will be a change in the asset structure as the firm adds more units of the asset(s) having the higher ratio(s) of marginal utility to marginal price and disposes of units of those with relatively lower ratios. This will tend to equalize ratios for several reasons, which differ in importance, case by case: (1) as more of a given asset is added to an asset-mix of a given size, there may be an increase in marginal risk due to a loss of diversification, involving a greater dispersion from the mean expected yield. (2) Where there is an imperfect market for assets, purchase of more units may involve a higher marginal price. (3) Where there is an imperfect market for the output of the asset, the marginal yield will decline as more of the asset is added, and the marginal yield of the declining assets will rise. Of course, if both categories of assets produce the same, or closely substitutable, type of output, this reason would not apply.

Failure to meet the second equilibrium requirement

will involve a change in the liability structure for reasons analogous to those given above, and subject to similar limitations. Failure of the third requirement will lead to a change in the total size of the firm. That is, if the marginal utility/marginal price ratio of assets more than offsets the marginal disutility/marginal price ratio of liabilities, the firm will be induced to add to its liabilities until these two ratios balance each other.

The foregoing paragraphs hardly constitute an exposition of microeconomic asset theory but are simply intended to indicate the general approach and character of this theory. The macroeconomic aspects have been ignored because they are not germane to the problem of this study, though they are of first importance in asset theory - indeed, macroeconomic considerations have constituted a good share of the motivation behind its development.

In applying this approach to the bank firm, our task is not so much that of applying an existing well-developed framework to the bank situation as that of developing the theory, now in rudimentary form, into a useful tool of analysis for the study of the bank firm.

The Model

It need hardly be mentioned that, in presenting an elementary model of bank asset-mix determination, no claim is made for detailed and accurate portrayal of reality. Obviously, the pattern of reaction of the bank to stimuli is exceedingly complex in terms of the variety of stimuli, the dimensions of

possible reaction, and the determinants of the actual reaction pattern to given stimuli. However, it is claimed here that, in many instances, the type and direction of response can be adequately represented, from the standpoint of the interests of monetary economics, by means of a relatively simple model.

A problem faced in developing this model - one which, indeed, is involved in developing any model - is the attainment of a suitable compromise between simplicity and realism: between a model so elementary that it bears no real resemblance to what it purports to represent and one that is too complex for ready exposition and comprehension. Accordingly, the compromise model presented here seeks to steer a middle course between these two extremes.

The exposition of the model will take the form of a series of propositions, with explanation and justification where necessary and with equations where helpful in summarizing relationships.

1. <u>In its asset portfolio, the bank chooses among three classes of assets: reserves, loans, and investments.</u> The last two terms are used here in their universally-understood senses, while both primary and secondary reserves are included in the "reserves" asset-class. Secondary reserves comprise those earning assets characterized by negligible risk of a decline in value due to market price fluctuations or changes in the financial position of the creditor. Inclusion of secondary reserves here rather than with investments was based on the reasoning that these assets have more in common with the former than with the latter; that is, they are closer

substitutes for primary reserves than for investments. Rodkey, for example, refers to both classes of reserves as "riskless" and lists the size of each as a determinant of the proper size of the other.[1] Precedent for this treatment may be found in the studies by Larsen[2] and Brown[3] already referred to.

It seems appropriate at this point to attempt to justify both the number of asset-classes used and the basis of classification. There appeared to be good and sufficient reason for using three asset-classes rather than two or more than three. As regards the former alternative, one can find some instances of use made of a two-asset model. In his dissertation Ira Scott uses two assets in his model of credit availability.[4] And Boulding uses a two-asset model in his discussion of the "pure marketer."[5] However, it was believed that a two-asset formulation would unduly restrict the scope of this analysis, since an important problem in bank theory is the nature and determinants of choice among earning assets.

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[1]Rodkey, Sound Policies for Bank Management (New York: The Ronald Press Co., 1944), pp. 19, 20, 27, 58.

[2]Larsen, op. cit., p. 124.

[3]Brown, op. cit., p. 57.

[4]Ira O. Scott, Jr., op. cit., Chapter III.

[5]Kenneth E. Boulding, A Reconstruction of Economics, pp. 39-48. In Boulding's analysis, the marketer is assumed to have an asset portfolio consisting solely of money and wheat, with the liabilities side consisting (initially) of net worth. However, the possibility is introduced (p. 42) of incurring money debt or "wheat debt" (i.e., by selling futures), thus enabling five items instead of only three in the balance sheet. Also, size of balance sheet is introduced as a variable, since the marketer can increase his total assets by increasing the size of his wheat-debt and money-debt accounts.

There is also the question of why only three assets were used rather than four or more. The reason relates mainly to the marginal worth of the resultant more realistic asset-structure balanced against the marginal cumbersomeness and complexity occasioned by such an addition. Since the present three-asset formulation enables treatment of both of the commonly-discussed types of banking risk - credit-risk (loans) and money-risk (investments) - addition of a fourth asset-class could contribute little in this direction. Also, the use of geometric representation would thereby be effectively precluded; and economists have long found graphic analysis a helpful expository device. Finally, it happens that many analyses of banking problems and much statistical material utilize three major asset categories: the particular ones which we have chosen. Thus, both the number of asset-classes to be used and the basis for classification were more or less automatically and simultaneously determined.

It may seem implicit in this formulation that the components of each asset-class are homogeneous. This is not necessarily the case. For example, one may think of all loans as being of the same "grade," i.e., having values of a certain criterion falling within a specified range or, where more than one criterion is used, falling within the range specified for each one. Similar considerations may apply to the other asset classes. Or, alternatively, one may think of a specified loan-mix, consisting of a certain <u>distribution</u> of loan assets among specified characteristics - size of loan, size of borrower, industry of borrower, interest rate, etc. - whichever character-

istics appear of significance. Similarly, for investments, one may have in mind a certain distribution of United States governments, other governments, and private securities, all classed by nearness to maturity. Reserves, too, can be classed in meaningful ways. All that it is necessary to assume, then, is that the marginal quantity of each asset-class has the same relevant characteristics as the asset-class as a whole. This we hereby do, introducing in our defense the fact that such treatment is implicit in much interpretation of banking data. One reads continually of "member bank loans" rising or falling absolutely or as percent of assets; or the reference may be to the bank's capital-to-risk assets ratio as an indication of safety, etc., rarely with any qualification in either case referring to the make-up of these accounts.

Even when so interpreted, however, the three-asset model hardly portrays reality accurately. Intra-class shifts may be of great significance, especially over a period of years or during a period of rapid economic change. This point hardly needs elaboration: one has only to glance at the changed make-up of the "Member Bank Loans" figures or the "Investments" figures, as given in the Federal Reserve Bulletin. And even these figures obscure certain important changes and developments in types of business, agricultural, real estate, and "other" loans. To attempt to describe algebraically all the possible balance-sheet reactions to various stimuli would result in a model of such cumbersomeness as to be virtually unusable.

To conclude: although the three-asset formulation

used here is based on considerations of simplicity and relevance - as to both number and choice of variables - its "symbolic" nature must be borne in mind. It does not mirror reality nor does it attempt to. Rather, it seeks to capture significant elements of reality - significant, that is, from the standpoint of monetary economics. The dangers of misinterpretation inherent in this procedure are obvious; but it is maintained that this approach may be useful in considering the problems of the bank asset-mix.

The first proposition may, for convenience, be rendered algebraically as follows:

$$(1)\quad R + L + I = A$$

where assets (A) consist of reserves (R), loans (L), and investments (I).

2. The total quantity of assets is given - the purpose of this requirement is to enable concentration on purely "portfolio" problems. Although this does some violence to realism, the fact is that size is not generally susceptible of substantial change through bank policy,[1] so most discussions of the problems of bank management concentrate on asset-mix considerations. Since our main concern, therefore, is with ratios rather than with absolute amounts, we may rewrite equation (1) as:

$$(1a)\quad R/A + L/A + I/A = 1.$$

3. The utility of a collection of assets depends on the yield and risk associated with it. - Or, expressed symboli-

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[1]The only generally important exception is growth through merger.

cally, where U represents utility, y is net yield, and r is risk:

$$(2)\quad U = U\ (r,y)$$

Each of these variables requires clarification. Utility, as used in this setting, has the customary meaning of level of satisfaction and is not assumed to be cardinally measurable; but the concept is applied not to an individual but to an institution. This usage is not without precedent. In a recent paper E.R. Rolph applied utility to government: "An outstanding national debt is looked upon as providing utility to a government...The composition and size of an outstanding national debt is optimal when the marginal utility of each kind of debt instrument is made proportional to its marginal cost."[1]

Net yield is a measure of the present value of expected gross receipts from a collection of assets, less expected costs involved in maintaining it over a given time-period, plus (minus) expected appreciation (depreciation) in value between the beginning and the end of the period.[2] A problem arises concerning the precise meaning of "expected." Economists have wrestled with this problem for several decades without coming to any agreement, and the present author has no ultimate synthesis to

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[1] E.R. Rolph, "Principles of Debt Management," AER, XLVII (June, 1957), p. 302.

[2] A possible slight change in total assets is involved here so, to pacify the fastidious reader, let it be assumed for the time being that all earnings are paid out and that all losses are met by capital contributions of stockholders.

offer. Probably the most widely-used approach has been in terms of probability theory. The subject, in reasoning about a possible course of action, is assumed to develop mentally a notion akin to a probability distribution of possible outcomes. Writers differ as to which characteristics of the probability distribution are most important to the subject: the mode and the range;[1] the mode and the "practical" range (ignoring the "outcomes at both tails of the distribution,"),[2] the mean and the coefficient of variation;[3] the mean and the range;[4] the positive versus the negative portion of the distribution;[5] and probably others. There is also the possibility that more than two properties of the probability distribution really should be included, adding to a measure of central tendency and a measure of dispersion some characteristic such as skewness,[6] or asymmetry;[7] and there have even been attempts to deal with "probability distributions of probability dis-

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[1]Melvin Reder, Studies in the Theory of Welfare Economics (New York: Columbia University Press, 1947), p. 78.

[2]Oskar Lange, "A Note on Innovations," Review of Economic Statistics, XXV (1943), pp. 19-25, reprinted in William Fellner and Bernard F. Haley (eds.), Readings in the Theory of Income Distrubution, (Philadelphia: The Blakiston Co., 1949), pp. 182-183 of the latter source.

[3]Makower and Marschak, op. cit., p. 273.

[4]Boulding, Reconstruction of Economics, pp. 126-127.

[5]Evsey D. Domar and Richard A. Musgrave, op. cit., pp. 388-422.

[6]Boulding, Reconstruction of Economics, p. 118 and Makower and Marschak, op. cit., p. 294.

[7]Makower and Marschak, op. cit., p. 272.

tributions."[1] But until this whole subject is endowed with more empirical content, there seems to be no reliable way of choosing among these competing alternatives. A consensus would appear to be that, as an acceptable minimum, one must consider some measure of average value and some measure of dispersion or variability. One simply chooses the measures that seem to him, strictly on the basis of "common sense," to conform most nearly to the way the asset-holder thinks. Let us, accordingly, define net yield as the modal value of expected gross receipts from a collection of assets less costs involved in maintaining it plus (minus) the appreciation (depreciation) in value of the collection between the beginning and end of the period under consideration.

The third term in equation (2), risk, may be defined as the range of expected values of the net yield of a collection of assets during a given period.

Equation (2) can be graphed by measuring yield along the Y axis, risk along the X axis, and drawing indifference curves sloping upward to the right,[2] becoming vertical at fairly low rates of net yield.[3] Figure 3 is such a graph, showing the bank's attitude toward risk and yield. Several

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[1]This procedure, as used by Tintner, is criticized by Albert G. Hart in his "Risk, Uncertainty, and the Unprofitability of Compounding Probabilities," in Studies in Mathematical Economics (1942), reprinted in Fellner and Haley, (eds.) op. cit., pp. 547-557.

[2]The works cited above by Lange (p. 183), Reder (p. 78), and Boulding (p. 118) contain graphs of this general type.

[3]cf. Henry Wallich, "The Changing Significance of the Interest Rate," AER, XXXVI (December, 1946), p. 768.

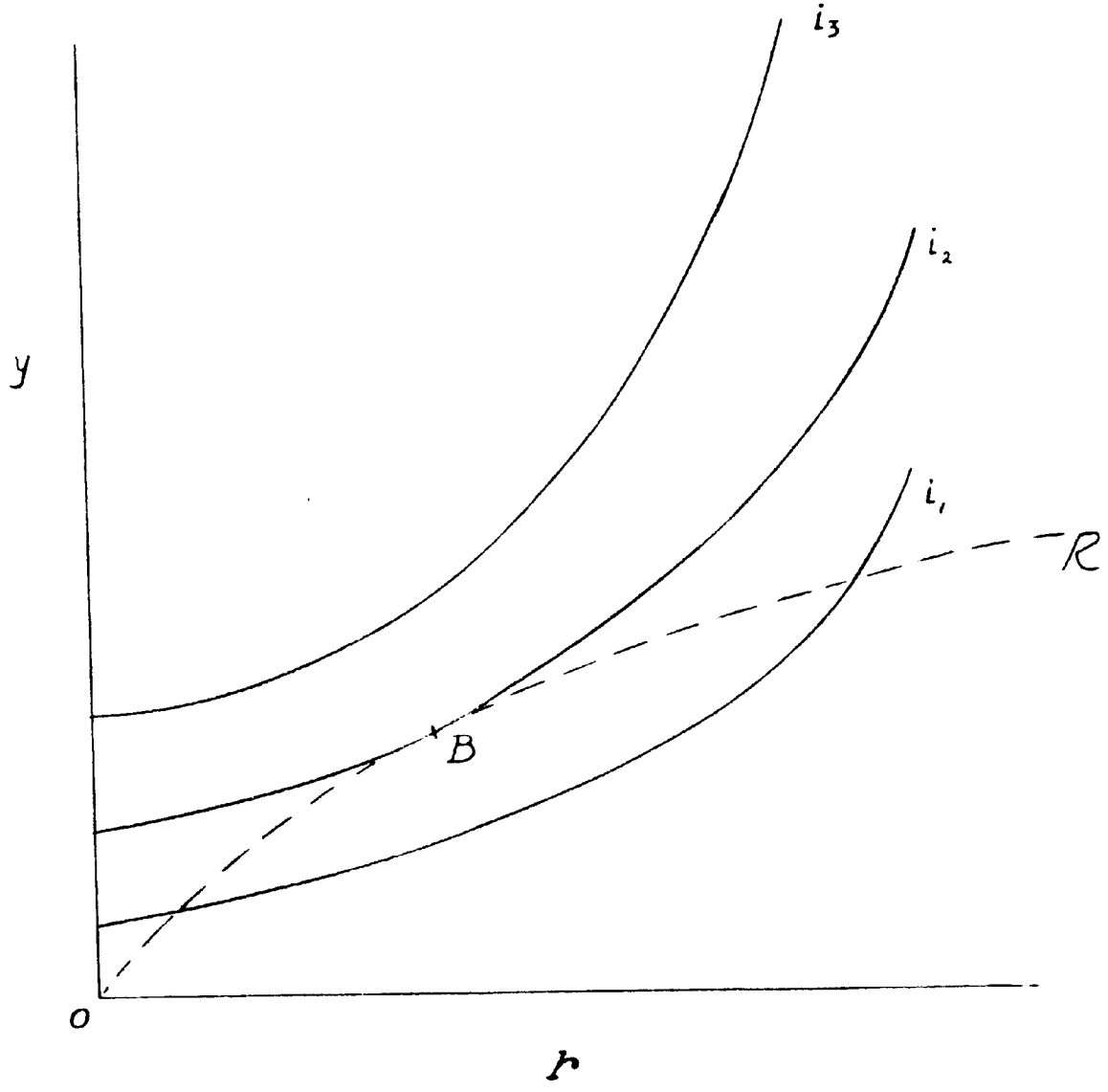


Fig. 1.--Equilibrium Asset-Mix

indifference curves are drawn, the higher-numbered curve always preferable to the lower-numbered. The shapes of the indifference curves embody three plausible conditions: (1) utility is an increasing function of yield, and the marginal utility of added units of yield declines; (2) utility is a decreasing function of risk, and marginal disutility of risk-taking increases as risk increases; (3) the marginal utility of yield is independent of the marginal disutility of risk. Accordingly, the indifference surface must have certain properties: (1) each indifference curve must have a positive slope, since yield is a "good" and risk is the opposite (conditions 1 and 2); (2) the slope of each curve must increase, moving upward and to the right, due to the diminishing marginal utility of yield coupled with the increasing marginal disutility of risk (conditions 1 and 2); (3) for a given value of y, successively higher indifference curves have gentler slopes (condition 2); and (4) for a given value of r, successively higher indifference curves have steeper slopes (condition 1).[1]

A "market opportunity curve" is drawn indicating the greatest amount of yield which may be "purchased" by incurring various alternative degrees of risk. Such a curve is OBR. Position O indicates R/A = 1.00; position R indicates the riskiest possible asset-mix, in line with the requirements governing the make-up of R, I, and L as given above. The reasons for the shape of OBR - particularly the declining $\Delta y/\Delta r$ - relate to the fact that, as yield increases (1)

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[1]Domar and Musgrave, op. cit., p. 402.

the risks accompanying a declining reserve ratio may be assumed to increase more rapidly after a certain point because the range of values of yield will increase, particularly in a negative direction due to the possible consequences of illiquidity, and (2) diversification declines, since further increases of yield demand increased concentration of the portfolio in the higher-yield earning asset, usually L.[1] Given the bank's preference pattern and market opportunity curve, it will choose that combination represented by the point at which the two curves are tangent.

Other determinants of utility might be postulated in addition to risk and yield, such as conformity to tradition, community service, or the serving of the interests of those who control the bank,[2] but the two singled out are, it is generally agreed, by far the most important determinants in the vast majority of conceivable cases.

To facilitate analysis of yield, the net yield term can be broken down into gross yield (Y), comprising the present value of expected gross receipts and appreciation

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[1] See ibid. for more detailed discussion of these matters.

[2] "Money is not desired just because it is more liquid than something else, and other financial assets are not desired simply because their illiquidity has been overcome by the bond rate of interest. Rather, a particular stock of money is wanted because the marginal dollar in money balances provides more utility, in terms of liquidity, than the same marginal dollar would provide, when invested in other financial assets, in terms of income, liquidity, corporate control, patriotic satisfaction, insurance, or dozens of other portfolio attributes." John G. Gurley and Edward S. Shaw, "Intermediaries and Monetary Theory: A Criticism of the Gurley-Shaw Theory: Reply," AER, XLVIII (March, 1958) p. 133.

(depreciation), and expected costs (C), also adjusted to the present.

$$(3)\quad y = Y - C$$

4. Gross yield depends on the asset structure and on the level and structure of interest rates. - Since gross yield is ex ante, this statement evidently is based on the commonly-held assumption that present rates affect expected future rates. "Since prospective yield is hard to pin down, banks have come to lean heavily on experienced yield as an index of yield to come."[1]

$$(4)\quad Y = Y\,[\overline{L}/(L + I),\ R\ /\ A;\ i_L,\ i_I]$$

The first and second terms within the brackets denote the asset-mix; the third and fourth denote interest rates on loans and investments, respectively.

5. Cost depends on the asset structure and deposit interest rates. - The rationale of this statement hardly needs elucidation. Here, present rates on deposits are held to be a guide for expected future rates.

$$(5)\quad C = C\,[\overline{L}/(L+I),\ R/A;\ i_D]$$

The only new term, i_D, represents interest rates on deposits.[2]

6. Interest rates on earning assets and deposits are autonomously determined - This statement is reasonably realistic in the case of investments.[3] However, it is also

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[1] Shaw, op. cit., p. 179.

[2] Realism would probably be increased by dynamizing these last few equations, but complexities thus introduced would subvert the primary requirement of this model: a balance between realism and simplicity.

[3] Exceptions being the very largest banks, which may

not too remote from reality in the case of loans. For many reasons, rates on various types of loans may be under strong external pressure toward stability or be largely outside the control of the bank. Anticipating the discussion in Chapter VI, we may list some of these factors here: a high degree of competition in some loan markets, the influence of custom and collusive arrangements on some loan rates, and usury and small-loan statutes which, by stipulating ceiling rates, may actually establish effective rates. Of course, rates do change, but slowly and in the face of considerable friction; so this assumption may be useful at least as a first approximation. As will be elaborated in Chapter X, much the same reasoning applies to deposit interest rates. Here, too, rates are affected by competition, custom, collusion, and government.

7. Risk is functionally related to the asset-mix - That is, the range of expected possible net yields varies with the composition of the bank's assets:

$$(6)\quad r = r[\overline{L}/(L+I),\ R/\underline{A}]$$

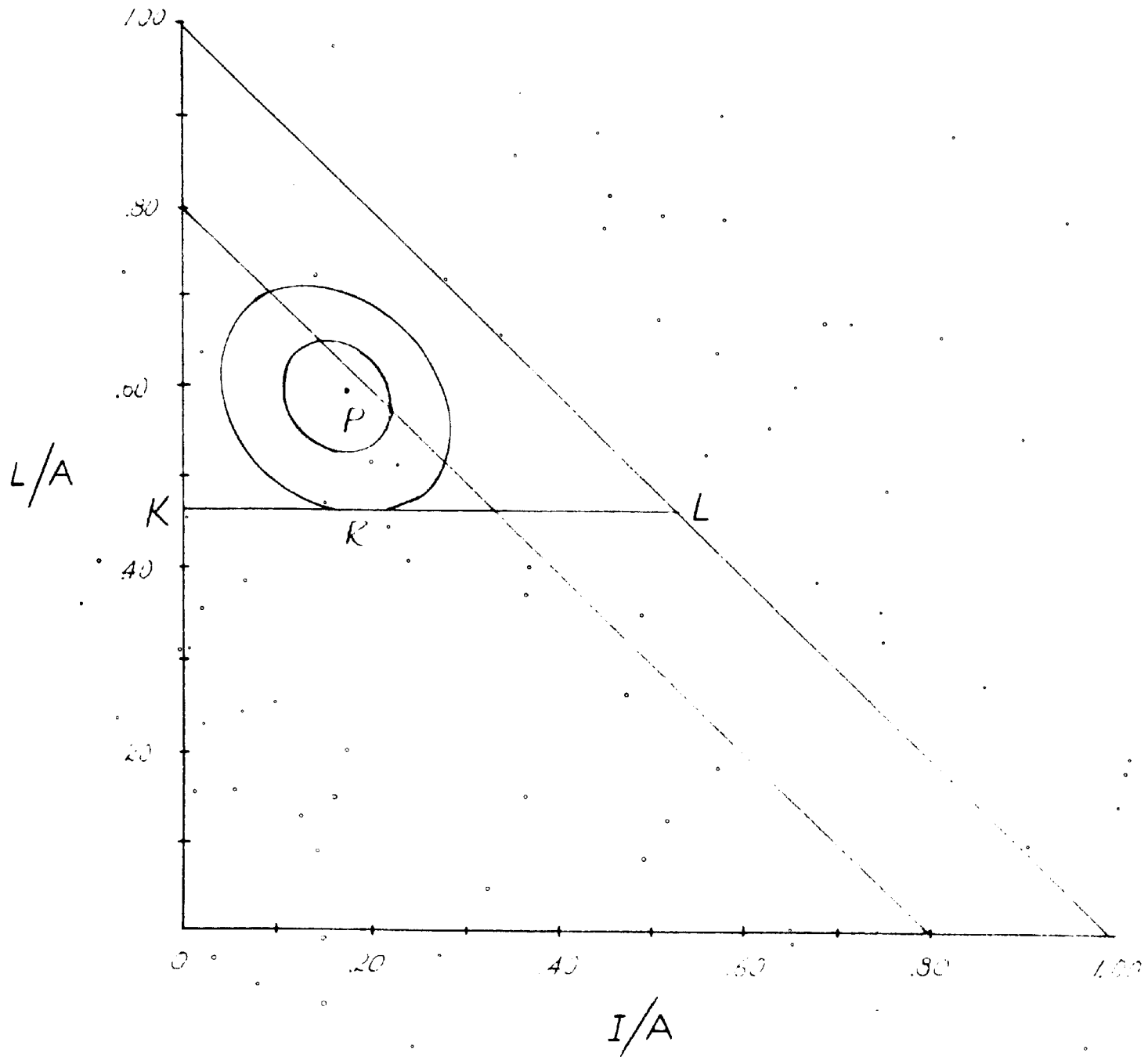
8. Utility is functionally related to the bank's asset-mix - This follows from the fact that utility is related to risk and yield (equation 2), which are, in turn, dependent upon the asset-mix (equations 4-6):

$$(2a)\quad U = U'(L/A,\ I/A,\ R/A)$$

These relationships may be visualized with the aid of a diagram (Figure 4). Since this figure will be found useful in connection with material in several subsequent chapters, it will be given the designation of the Basic Diagram.

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at times affect the market price of certain securities by their individual actions in buying or selling large blocs.


100
80
60
40
20
0
20
40
60
80
100
L/A
I/A
P
K
K
L

Points along the X axis represent the percent of assets in the form of investments; points along the Y axis, the percent in the form of loans. The line joining the two 100 percent points represents all possible combinations of loans and investments, assuming zero reserves. The slope of this line is -1, so that, for every gain in loans, expressed as a percent of total assets, an equivalent amount of investments, also expressed as a percent of total assets, is given up. In similar fashion, the line joining the two 80 percent points on the axes contains all possible combinations of loans and investments, with reserves amounting to 20 percent of assets, and so on for other similar diagonal lines. Thus, any point on or within the isosceles right triangle bounded by the X and Y axes and the diagonal "100 percent line" represents a possible combination of loans, investments, and reserves, or any one or two of these; and this triangle contains all of such asset-mixes possible.

The bank's preferences with respect to various combinations of the three classes of assets is represented by a preference-map. Several closed indifference curves are drawn so that the system of curves seems to converge on a point (P). By virtue of the fact that it represents the peak of the preference surface, this point must be considered the most desirable asset combination. As between any two indifference curves, the one that lies between the other and point P is considered superior. It is further assumed that the closer one moves in any direction toward P, the less rapid is the improvement in utility, i.e., the lower is the (positive)

value of marginal utility.

The reason that the curves are drawn closed is that the various points within the diagram refer to percentages of total assets, not amounts. If the indifference curves were drawn in the usual manner for two goods - convex with respect to the origin and numbered so as to indicate that, the more of either or both, the better off is the subject of the diagram - it would mean that, in this case, the larger the percentage of assets accounted for by loans and investments, i.e., the less reserves, the happier the bank (administration) feels. This would obviously be at variance with banker behavior. Instead, the curves as drawn in this diagram express the logical assumption that, after a certain point, adding more loans and/or investments to an asset-mix causes the bank to feel worse off because of the risks associated with lower reserve ratios.

The "single peak" assumption is not essential and cannot be proved, but it seems reasonable to hold that, at any given time, there is an asset-mix which is considered by the bank to be superior to any other. Similarly, the assumption of diminishing marginal utility in the direction of P cannot be based on concrete evidence but it seems logical that the closer the point representing a given asset-mix lies to point P, considering distance in one direction only, the less urgent is a shift in asset-mix likely to be regarded by the bank; and the greater the distance, the greater the urgency to change.

It may be noted that utility can be read as a function

of any one of the three ratios, the relationship between the other two being held constant. For example, the general character of the function:

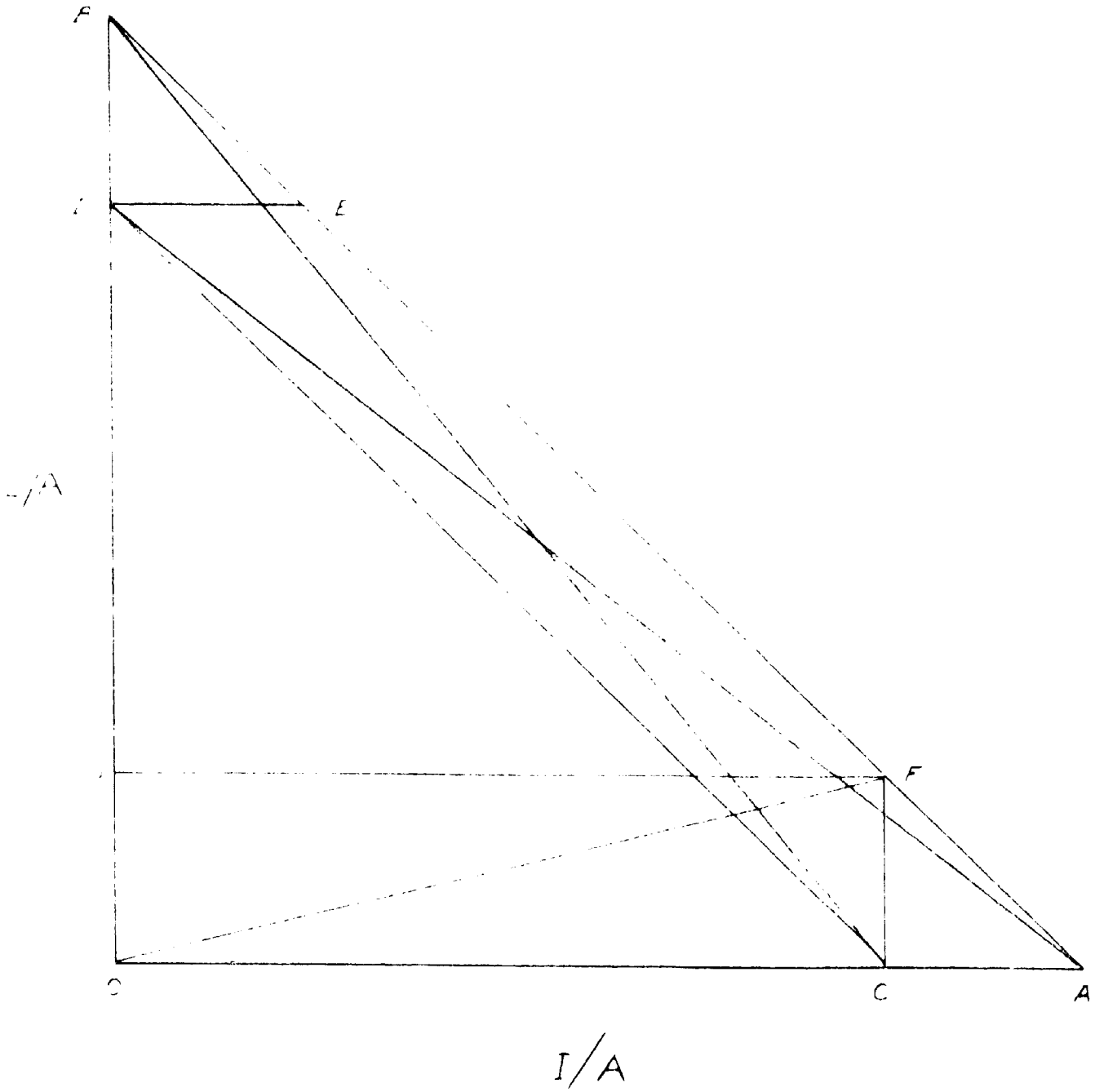
$$(2b) \quad U = U_L\,(L/A)$$

i.e., with respect to whether a rise in L/A is associated with a rise or fall or no change in U, will depend on whether R/A or I/A or R/(R+I) is held constant or some other condition is imposed. In terms of the Basic Diagram, redrawn, with preference-map omitted, as Figure 5, if R/(R+I) is constant, the relationship between utility and L/A is found by moving along a straight line (such as CB) from a point on the X axis (where L/A=0), corresponding to the proper R/(R+I) ratio to the upper corner (where L/A=1.00). Each point on this line represents the same R/(R+I) ratio. If R/A is held constant, the appropriate line (e.g., CD) runs from a point on the X axis corresponding to the designated R/A ratio diagonally to the Y axis and the point corresponding to the same R/A ratio. Finally, where I/A is constant, the appropriate line runs vertically from a point on the X axis. Line CF is an example.

The character of the function

$$(2c) \quad U = U_I(I/A)$$

that is, as to whether dU/ d(I/A) is positive, negative, or zero, also is dependent on the assumed behavior of the rest of the asset-mix. With R/(R+L) fixed, the relationship is found by tracing a straight line (such as DA) between the point on the Y axis (I/A=0), giving the appropriate R/(R+L) ratio, to the lower right corner, where I/A=1.00. If R/A is held constant, the relationship is the mirror image of


F
E
F
O
C
A
I/A

that in equation (2b) above, where R/A is given (line DC). If L/A is given, the line from which the relationship between U and I/A can be ascertained is a horizontal one. An example is DE, running rightward from D on the Y axis (I/A=0), at the point describing the proper L/A, to E on the (L+I)/A = 1.00 line.

Finally the character of

$$(2d) \quad U = U_R^{\cdot}(R/A)$$

also depends on the behavior of L and I. If L/A is held constant, the relationship is the mirror image of equation (2c) with L/A constant (e.g., FC). With I/A given, the relationship is the mirror image of (2b), with I/A constant (e.g., FG). If L/(L+I) is given, the relationship is found by tracing a straight line (such as FO) to the origin from the diagonal (L+I)A=1.00, at a point denoting the given L/(L+I) ratio.

Not enough is known about the "shapes" of these functions to justify any generalizations. The intent in discussing them has been partly to bring out certain mathematical properties of the diagram but mainly to demonstrate as clearly as possible the idea that the effect of a change in any one of these asset ratios on utility will depend on what is assumed to happen to the rest of the asset-mix, that one cannot properly discuss the relationships given by equations (2b)-(2d) under <u>ceteris paribus</u> assumptions unless he defines the <u>cetera</u> that are assumed <u>paria</u>.

Several other attributes have been built into the shape of the preference structure. First, the position of point P is based on the usual assumption that the bank normally wants

a large fraction of its assets in the form of loans, balanced by reserves for liquidity and investments for diversification. Many influences are operative on this point - on the whole surface, in fact - but elaboration must wait until later chapters, particularly V-VIII.

Second, the most-preferred earning-asset mix - L/(L+I) - is considered independent of the reserves/assets ratio. In terms of the Basic Diagram, a line drawn from O through P is the locus of the points of tangency of indifference curves with diagonal "iso-reserves" lines. The reasoning behind this is essentially negative: there seems to be no firm basis for assuming that, at higher R/A positions, the bank will generally prefer either more loans or more investments. Under certain circumstances, e.g., when new reserves are easy to obtain at reasonable cost on the basis of loan paper while investments can be sold only at a sizeable loss, a lower reserve ratio would be associated with higher loan-preference. On the other hand, a highly stable and competitive market for securities plus the conviction that the loan account is highly illiquid would tend to induce preference for more investments and less loans in response to a lower reserve ratio. As Whittlesey expressed it: "The shift from loans to investments served not so much to increase the vulnerability of bank portfolios to market fluctuations as to expose them to a different type of market fluctuation. Investments are more likely to be jeopardized by a decline in bond prices, and loans are more likely to be jeopardized by a decline in commodity prices."[1]

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[1]Charles R. Whittlesey, op. cit., p. 153.

Thirdly, above and to the right of P, utility drops sharply, while below and to the left the decline is less precipitous. The essentially common-sense basis is the fact that, where the preferred reserve ratio is 20 percent, a shift to 30 percent would probably be less disconcerting than a shift to a 10 percent ratio. In similar manner, though perhaps less intensely, a given increase in the L/A or I/A ratio, measured from the preferred ratio, would probably involve greater loss of utility than would result from an equal percentage decline.

The connection between the diagrammatic representation of equations (2) and (2a) is easily seen. Since utility is a function of risk and yield and these two, in turn, of the asset-mix, it is evident that, for each point on the Basic Diagram, representing an asset-mix, there corresponds an expected modal value (yield) and an expected range of values (risk) which returns could take. The amount of utility associated with a given asset-mix represents the attitude of the bank toward the particular combination of yield and risk associated with this asset-mix. The utility associated with each asset-mix is similarly determined and, in turn, determines the preference surface of the Basic Diagram.

9. <u>The bank achieves equilibrium in its asset structure only when marginal utility is zero in all directions and is positive in the neighborhood of this position</u> - Expressed algebraically:

$$(3)\quad \left[\frac{\partial^2 u}{\partial(L/A)\partial(I/A)}\right]^2 - \frac{\partial^2 u}{\partial(L/A)^2}\cdot\frac{\partial^2 u}{\partial(I/A)^2} < 0$$

$$(4)\quad \frac{\partial^2 u}{\partial(L/A)^2} < 0$$

This equilibrium point is, of course, point P.

10. <u>At the given rate of interest on loans, the bank is restrained as to the fraction of its assets which it can commit to loans by demand limitations</u> - This condition may be rendered

$$(9) \quad L/A = K$$

and depicted on the Basic Diagram as a horizontal line, such as KL, which may be referred to as the loan demand line. All points located below KL in the Diagram are "possible," but all points above are "impossible" because the bank cannot place a larger proportion of its assets in loans than represented by the vertical distance between the X axis and KL. If point P lies above KL, the equilibrium position is at R, where $\partial U/\partial (I/A)=0$ and KL imposes a "boundary maximum."[1] However, if P lies below KL, no constraint is felt by the bank; and it achieves its optimum position only by turning away some "worthy" applicants for loans.

This construction, an arbitrary "loan limit," is not theoretically elegant and is admittedly superficial, but it seems to describe fairly well the feelings of the average bank in this regard as of a given point in time. Reducing interest rates to attract new loan demand or raising them to take advantage of relatively high demand are expedients used by the bank to shift both P and KL, as are changing credit standards. These are beyond the scope of this elementary model but will be discussed in Chapter VI.

Concluding Comments

Several points may be raised relative to the model as a whole. First, in concentrating attention on assets, the

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[1] See Chapter IX, p. 223, for further discussion of the concept of "boundary maximum."

fact is obscured that the whole balance sheet is simultaneously determined. While granting this, it is maintained that a reasonable approximation to the nature of bank behavior can be achieved by treating both size and the liability structure as given, and that the advantages of more intensive consideration of asset-mix problems outweighs the disadvantages of a model that is somewhat too narrow in this respect. Liabilities and size considerations are, however, given due attention in Chapters X and XI.

Secondly, the bank may respond to changes in its environment in ways that have no strong direct balance-sheet effects. One such response is service charges. For example, the case may be cited of a suburban Chicago bank which received 28 percent of its earnings in 1946 in the form of service charges of various kinds.[1] This signifies that it might be possible for two banks with virtually identical balance sheets nevertheless to be institutions of quite different characters, having highly dissimilar "flow patterns." Such banks as the one cited are quite exceptional, however. In 1956, service charges on deposit accounts of member banks amounted to only 5.1 percent of earnings, and this figure has varied over the 1952-1956 period from 4.8 percent in 1952 to 5.2 percent in 1954.[2] The figures for all non-interest earning categories for these banks during this period varied from 15.2 percent in 1953 to 16.0 percent in 1954.[3] Thus, this criticism is not of general importance, although in unusual cases it may be.

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[1] P .W. Ballance, "Profit Policies for Suburban Banks," Burroughs Clearing House, XXXI (June, 1947), pp. 26-28.

[2] Federal Reserve Bulletin, May, 1956, p. 515; and June, 1957, p. 715.

[3] ibid.

There are other types of responses that are not adequately described in balance-sheet terms - or, more accurately, by means of the usual highly-condensed bank statements. Some, like arrangements whereby utility bills and retail charge-account payments are handled through the bank, bank life-insurance activities, etc., can be handled either by considering our model as describing only the commercial-banking department of a department-store type bank or by ignoring them on grounds of their being of definitely secondary importance. Other types of responses, such as the use of participatory arrangements in lending, provision of drive-in banking facilities, all sorts of bank advertising and promotional activities, etc., must be left outside this model for the sake of simplicity, although some of them are discussed in Chapter VI as alternative and supplementary to loan-rate changes.

Another point: we have implicitly assumed away costs involved in shifting the bank asset structure, both between reserves and earning assets and between classes of earning assets. For accuracy's sake, we should take account of these costs by representing the bank's present asset-mix as located atop a peak on the preference surface. Thus, moving to an asset-mix lying closer to P might involve lower utility due to the costs (and bother?[1]) involved in making the change. In the interests of simplicity, however, it seems preferable to exhort the reader to keep in mind this qualification as we

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[1]For example: "Thus a person is deterred from investing money for short periods partly because of brokerage charges and stamp duties, partly because it is not worth the bother." Hicks, op. cit., p. 7.

go on: a bank conceivably might refrain from moving toward an asset-mix which, with respect to risk and yield, is superior to its present one because of the costs and (perhaps) bother of making the change.

And finally, there is the fact that the sale of certain assets may involve an increase (or decrease) in the recorded value of the bank's total assets; thus it is not entirely realistic to assume, as we have, that in moving from one asset-mix to another there is no change in A. While the truth of this argument must be granted, its significance is probably small. Let us assume a fall in interest rates, so that the bank, by selling its investments, could realize a considerable "profit from the sale of securities" and, consequently, increase its total assets and capital. An increase in these items will generally[1] increase utility. Against this factor must be placed the fact that, unless interest rates are expected to fall soon and substantially, the bank will realize a lower <u>rate</u> of return on its assets, whether held in reserves or reinvested. Or, assume a rise in interest rates, making investments "cheaper" than before. Will the bank therefore be inclined to buy large quantities of investments? On the contrary, the bank may even <u>sell</u> such securities, as happened on a large scale in 1955-1956. Obviously, banks could not have been thinking solely in terms of <u>prices</u> of securities. In Basic Diagram terms, the loan demand line probably advanced toward P while, at the same time, P may have been moving toward

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[1]For exceptions, see Chapters X and XI.

the X axis as the rate differential between loans and investments grew smaller. The differential continued to be substantial, however, and constituted an important offset to the influence of a fall in the price of investments.[1]

It is evident that, in general, the inducement to change the asset-mix on grounds of the effects of such a change on bank size tends to be offset by the effects on the rate of return on assets. The exceptional case - when the bank expects interest rates to change soon and substantially - is probably of small importance usually because most banks are ill-advised to speculate in securities.[2] Thus, we assume that, in considering various alternative asset distributions, the bank will place primary emphasis on the flow of income rather than the size of the balance sheet.

Asset-Adjustment Process

It is not sufficient simply to state that the bank firm, finding itself at a position other than its preferred position, considering constraints, will simply shuffle its asset structure around so as to reach the preferred position. The asset-adjustment process itself - means of adjustment, sequence of events of the process, and the timing of adjustment - is highly relevant to the theory of the bank firm.

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[1] W.L. Smith, "On the Effectiveness of Monetary Policy," AER, XLVI (September, 1956), pp. 590-593.

[2] Cf. Robinson, op. cit., pp. 292-293; and Homer J. Livingston, Management Policies in American Banks (New York: Harper & Bros., 1956), pp. 57-59.

Means of Adjustment

There are several means by which a bank may adjust its asset-mix. Most obvious is through simple exchange of assets. Exchange may be effected through (1) purchase or sale of an earning asset, usually involving a change in the amount of earning assets counterbalanced by an opposite change in reserves;[1] (2) retirement or calling of an existing earning asset;[1] (3) exchanging one earning asset for another, e.g., through (a) refinancing a mortgage loan, (b) renewing a note, or (c) replacement of an ordinary loan by a term loan arrangement.

There is another group of expedients used to achieve a more preferred position which should be mentioned, even though, strictly speaking, they involve a change in the total amount of assets as well as in the mix and are thus outside the scope of the elementary model. One of these is borrowing or its opposite, repaying. Borrowing (repayment) changes the asset-mix in the direction of greater (less) liquidity of assets. Another means is the securing of an increase in primary deposits, thus achieving an increase in the reserves/assets ratio, if this is the desired direction of adjustment.[2]

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[1] Exceptions may occur when the assets are sold to, purchased from, exchanged at maturity with, or called by, a depositor of this bank. The transaction would not then constitute an exchange of assets but rather the simultaneous creation or destruction of an asset and a liability.

[2] This increase in deposits presupposes some effort, through price or non-price competition methods, to secure the increase; but we neglect this matter here, except to note that the preferred position, if achieved through, say, advertising, must be thought of as taking the asset and liability effects of advertising into consideration.

A third expedient is the sale of capital stock or the repurchase of stock. Sale of stock increases the reserves/assets ratio, in so far as purchasers are non-depositors, and retirement decreases it. The fourth means in this category is payment of dividends and its opposite, assessment of stockholders, to the degree that these devices produce a net decrease or increase, respectively, in reserves. Finally, the making and retiring of bank loans is an expedient that fits this category. The former reduces the reserves/assets ratio, at first through an increase in the denominator and then through a decrease in the numerator as the proceeds of the loan are withdrawn. Only rarely is the withdrawal complete, however, for three reasons: (1) the bank may, and often does, require a compensatory balance; (2) the borrower may wish to keep a part of the loan in reserve or have overestimated his needs; (3) in the case of discounts, part of the loan is credited not to "deposits" but to "unearned interest." Thus, the effect of an increase in loans is likely to be between that of an exchange of assets and that of an increase in assets equal to the increase in loans. The reverse holds, of course, for a repayment of loans. Retirement of a loan may simply involve an equal reduction in deposits or, if the borrower pays part or all in cash or other reserve items, partly or entirely an exchange of assets. The former method increases the reserves/assets ratio but not reserves; the latter increases both.[1]

[1]Another means of adjustment consists not of moving the present position toward the preferred position but of the opposite expedient - moving the preferred toward the present - by adjustments on the liabilities side. A clear, and perhaps the only, example of this is found in the case of those banks that, following policies previously set up, find their loan portfolios

Path of Adjustment

There is virtually no literature on the topic of the path which the adjustment process follows, that is, the order of events of the process; but the importance of this problem, both theoretical and with respect to monetary policy, demands that it be given at least a brief examination at this point. We may safely assume that the bank, upon experiencing a severe shortage of reserves, will not thereupon purchase quantities of securities and actively solicit loans. Rather, it will take steps to move toward a more favorable asset position. However, a question is raised by W.W. Cooper as to whether the approach is direct or is in the form of oscillations centering about the equilibrium point.[1]

The bank is said by Cooper to swing between a position characterized by excess liquidity and insufficient earnings and one in which earnings are so large and liquidity so small, relatively, that the bank seeks to move toward a more liquid position. Although this formulation is in terms of liquidity versus earnings and ours is in terms of reserves versus earning assets, there is no essential difference between the two versions, with this exception: Cooper's version seems to imply that the less liquid is the firm, the more earnings it will realize. This would be true only up to a point; beyond that point, the further reduction of liquidity would cause the expectation of

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uncomfortably heavy. Adjustment is effected not through reducing loans outstanding but through a gradual rise in the capital of the bank, either through sale of stock or through retained earnings. This topic is covered in Chapter X.

[1] Cooper, op. cit.

lower profits because of increasing probability of the bank's incurring losses by being forced to liquidate earning assets in order to meet claims on its funds by depositors and outsiders.

Cooper's argument, translated into the terminology of this study, might be represented on the Basic Diagram as a movement centered on point P. Starting at a point below and/or to the left of P, the bank, finding itself excessively liquid, begins to make loans and buy securities so that its asset position moves up and to the right. However (Cooper argues) the bank tends to go too far; it suffers various internal and external drains so that its liquidity is definitely impaired. Then it institutes an opposite set of actions which again result in overshooting the mark - deliberately, if the bank desires to maintain its preferred reserve position on the average.

> As the bank reduces its reserve position below requirements, it increases its profit position, then, above the 'equilibrium' level. If it is to maintain its reserve position 'on the average' it must then contract its output (loans) and hence its profits below the equilibrium level at another point in time.[1]

Two assumptions are implied in the above quotation that are not warranted. First, there is no reason to hold, as Cooper appears to do, that "equilibrium reserves" are equivalent to required reserves. This relationship is not stated explicitly, but it is the only explanation that makes sense of the phrase "If /the bank/ is to maintain its reserve position 'on the average'..." Certainly no bank, being deficient in working reserves for a period, would for that

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[1] ibid., p. 1212, n. 23.

reason alone seek to maintain larger reserves in another period. Second, we cannot assume that, to build up its reserve position. the bank "must then contract its output (loans)..." There are, of course, several ways of making up a temporary reserve deficiency in addition, and usually preferable, to contracting loans: selling securities, borrowing from the Federal Reserve or a correspondent bank, or borrowing on the federal funds market.

In addition to the above reason for expecting oscillatory behavior between liquidity and profits, Cooper adds the following reason:

> "Business-type firms may be said to receive at least partial cash payment for the sale of goods. When this happens, the absolute size of their cash position may increase even though the relative position falls....The peculiarity of a bank...seems to be that what it sells is cash for which no cash payment is received at time of sale. This results in absolute deterioration of cash position, and hence oscillatory behavior."[1]

Whether in actuality banks do exhibit oscillatory behavior of this sort is not verified by Cooper. Such behavior implies not only a lack of foresight on the part of banks as to reserve drains resulting from their lending activities but also an inability to learn from experience concerning this phenomenon. This may or may not characterize banks; empirical studies of individual banks are needed to prove or disprove Cooper's hypothesis and in other ways to provide information as to the path of asset adjustment.

Timing of Adjustment

A related problem concerns the length of time it takes the bank to adjust its actual to its desired position.

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[1] ibid., p. 1214.

Due to the impossibility of discovering ex ante the desired position or of analyzing ex post whether the desired position has meanwhile changed, this problem cannot be solved directly. Even a measurement of the extent of adjustment during an interval of time would not give a reliable indication because the preferred position may have been either near to, or distant from, the actual position. Also, as noted above, adjustments on the liabilities side may reduce the difference between actual and preferred asset-mix.

At first glance, this problem might appear to be similar to the one in connection with which Shaw's "response coefficient" is designed to be used. However, the two concepts - the timing of adjustment to a more-preferred asset position and the response coefficient - are conceptually quite different, as a brief examination of the latter will bring out.

Shaw's definition is as follows: "The ratio of purchases [of securities] completed in any period to capacity purchases or the ratio of surplus reserves drained away to surplus reserves available we shall call the response coefficient. The maximum value of the coefficient is 1...The minimum value is 0."[1] Later in his book, Shaw explicitly recognizes that the coefficient could have a value of less than zero, since the bank might dispose of earning assets even though it already has surplus reserves.[2]

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[1] Shaw, op. cit., p. 131. Italics in the original. Shaw adds later (p. 164, n. 1):

> "For mathematical elegance, at least, the response coefficient should be defined as the rate at which bank lending is exhausting surplus reserves in a minutely small time interval."

[2] ibid., p. 164, n. 1.

Thus a bank might, during a given period, move very rapidly toward a position representing the peak of its preference surface (referring to the Basic Diagram) and be characterized by a very low, or even negative, response coefficient, since the preferred asset-mix could contain a high percentage of surplus reserves.

The response coefficient is, in a rough-and-ready manner, measurable; the speed of movement toward a preferred-asset position is not. If a rapid shift in bank assets occurs, we cannot be certain, a priori, as to whether this was due to the distance between desired and actual asset-mix on the preference map, the difference in utility between desired and actual asset positions due to "peakness" of the surface, factors in the economic environment - monetary or other - facilitating a rapid movement, or some combination of these three.

CHAPTER V

GROSS YIELD: INTEREST RATE LEVEL

In the simple model described above, utility was represented as dependent on risk and yield, while these were considered to be related to the makeup of the three-class asset structure. The discussion must go beyond this model, of course, in recognizing the great variety of alternative types of assets available to the bank; but choices are nevertheless made largely in terms of relative yields and risks involved.

The first determinant of the relative attractiveness of various asset-mixes to be examined is gross yield. According to the definition given in Chapter IV, gross yield of a collection of assets is the present value of expected gross receipts from the assets plus (minus) the expected appreciation (depreciation). Thus there are several elements in ex ante gross yield of a collection of assets: (1) expected quantity of gross receipts from each asset and their time-distribution, (2) expected movement of the prices of the component assets, and (3) total quantity of each class of assets.

In the case of loans, the gross receipts from each item are fairly predictable, customarily set by agreement between borrower and lender. Most types of loans have no market price (exceptions being those for which there exists a secondary market), so element (2) is not often important. For investments, the situation is the same with regard to (1) as for loans; but (2) may play an important part in determining yield,

particularly if the assets involved in price changes are likely to be sold. Reserves, of course, score zero or nearly so with respect to (1) and are expected generally to vary little, if at all, in price.

Since interest rates play such a dominant part in determining both the expected quantity of gross receipts and the expected movement of prices, this factor has been singled out for rather careful study here as an influence on asset preferences. The major purpose of this chapter and of Chapter VI is to examine the nature of the influence of the interest-rate level and structure on the bank asset-structure. In so doing, it is advisable to make the usual ceteris paribus assumption: that only one factor at a time is varying.

A change in the interest rate level is defined here as an approximately proportional change in the whole pattern of interest rates. Any change in interest rates in which the predominant aspect is a shifting of the pattern of rates on various interest-bearing assets will be described as a change in interest rate structure. In practice, it may be difficult or impossible to distinguish between these two types of change; and level and structure changes generally occur together. However, for purposes of analysis, it has been thought expedient to discuss these two basic types of rate changes separately.

It must be emphasized that this analysis is essentially static. Unless otherwise noted, any change in rates is not associated with a change in expectation of a change in rates. The latter is a risk problem and will be dealt with in Chapter VII.

The Elementary Model and Rate Changes

According to the Model outlined in Chapter IV, yield and risk jointly determine utility, while interest rates influence yield. The effects of a rise in rates would, *cet. par.*, shift the market opportunity curve (OBR) of Figure 3, so that the curve moves counter-clockwise with O as pivot point. Thus, the bank can purchase more yield by means of a given risk, or the same yield with less risk, or can have a little of both - less risk and greater yield. At any point, the new curve slopes more steeply than the old.

The question is: will the new curve be tangent to an indifference curve to the right or to the left of the old? There is no clear answer, on the basis of this analysis: given risk, higher indifference curves slope more steeply, as does the higher OBR curve. In terms of the Basic Diagram, we can be certain that a rise in rates will raise the preference structure at all points except O, but we cannot be certain whether such a movement will shift the preference surface so that P moves upwards, denoting a stronger preference for loans - the riskier, higher-yield asset - relative to reserves, or whether the shift will bring about a stronger preference for investments or reserves. The same problem exists for the case of a fall in rates. We can get some notion as to what the results of a rate change will probably be by referring to certain empirical studies that have touched upon this matter. This will be done in the following section.

Effects on Reserve-Preference of Banks

Since Keynes' *General Theory* the discussion of liquidity

preference has evolved in several directions, among which are two that are relevant for our purposes. First, the importance of disaggregating the liquidity preference function has been recognized. Lintner observes that:

> the liquid balances of different important groups of holders behave very differently because they reflect the influences of substantially different sets of underlying determinants, moreover, shifts in balances between different types of holders may be of substantial importance, quite apart from changes in the totals of all balances held.[1]

Second, as was pointed out above, theoretical analysis, which for a time limited itself in this sphere largely to the simple relationship between money and the rate of interest, has been tremendously broadened, so as to constitute the elements of a general theory of assets. In other words, liquidity preference is considered within a much broader frame of reference. A quotation illustrates this statement:

> To "increase" contingency provisions means to shift to the right along the following two scales: first, long-term securities → short-term securities → cash; second, risky securities → safer securities → cash. Liquidity preference is a matter of shifting along scales such as these...not simply a matter of hoarding versus lending.[2]

Our discussion will reflect both of these evolutions from Keynes' version of liquidity preference; first, in that we isolate, for purposes of separate consideration, bank firms and their motivations for holding reserves and, second, in that we shall think in terms of the whole asset-mix in analyz-

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[1] John Lintner, "The Theory of Money and Prices," The New Economics, ed. by Seymour Harris (New York: Alfred A. Knopf, Inc., 1950), p. 515. Also see H.S. Larsen, op. cit., and Avram Kisselgoff, "Liquidity Preference of Large Manufacturing Corporations," Econometrica, XIII (October, 1945), pp. 334-344.

[2] William J. Fellner, Monetary Policies and Full Employment (Berkeley: University of California Press, 1946), p. 156.

ing the effects of changes in the interest rate level. In this section, we concentrate on the effects of rate changes on the bank's reserve preference; in the next, on the earning-asset structure.

We are aware that a change in the rate level may come about through a shift in demand for credit or an opposite shift in supply, or both. No distinction is made between these types here. Although changes in the total supply of credit may well be accompanied by a change in total assets of a given bank, this size-effect will very likely be of small importance to the individual bank for planning purposes, except in the rare case of a relatively large increase within a short time, as occurred during and following World War II.

Due to the fact that, especially in banking, liquidity is a term applied to a quality of the whole asset structure, we are almost forced in this study to substitute the home-made term "reserve-preference" for the Keynesian "liquidity preference" in order to avoid possible confusion.

Changes in the level of interest rates do not induce changes solely in desired reserves, of course, but rather have ramifications all through the asset structure. However, it has been thought expedient to consider separately the simple relation between the interest rate level and reserves in order to be in a position to discuss several empirical studies that have sought to discover more exactly the nature of this relationship.

There are actually five distinct reasons for banks' holding of reserves. In addition to the traditional three-some of transactions, precautionary, and speculative incentives,

banks are influenced by the legal reserve requirements and the level of their earnings as well. All of the various factors that influence the bank's holdings of reserves to any important degree can be classified under one or more of these five headings.

Reserves held for transactions purposes may be considered "working balances." These are cash reserves held to tide the bank over when withdrawals temporarily exceed deposits. Reserves held for precautionary or contingency reasons

> are held against the contingency of a cash deficit that may or may not occur in the present or some later fiscal period. This share of inactive or idle balances is acutely sensitive to pessimism about income prospects, to the urge for liquidity that typifies money panics, and to the uncertainties that plague any period of rapid change in income and expenditure.[1]

This motive will be discussed in Chapter VII since it is essentially a risk phenomenon. The third motive for holding reserves accounts for the so-called speculative balances, which are desired in amounts that vary with the relationship between existing and anticipated interest rates. The fourth reason requires no description at this point. The fifth reason may be called the "luxury" motive for holding reserves: higher earnings enable the bank to afford to hold more reserves;[2] the actual importance of this motive is not ascertainable as yet.

The first-listed motive for holding reserves - the transactions motive - is dependent on several factors, including size of bank, its form of organization, its location - none of

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[1]Shaw, op. cit., p. 280.

[2]Cf. the discussion in Chapter III on liquidity and profits.

which depend directly on the level of interest rates. Precautionary (contingency) balances respond to expectations as to future income but, by definition, not to interest-rate expectations. The balances held as required reserves obviously do not depend directly on interest rates either; and the effect of the level of earnings on reserve preference is only indirectly related to interest rates, i.e., higher rates mean higher earnings, other things equal. Therefore, in this section we are limiting the scope of the discussion to the effects of changes in the level of interest rates on balances held for speculative purposes.

In our analysis we shall relate the interest rate level not to total bank reserves but to the reserves-to-assets ratio because this will enable us to fit the present discussion into the framework used in the rest of this study and also because the liquidity position (in the narrow sense of the term, embracing cash assets only) is best measured not simply by the amount of monetary assets but by the ratio of these assets to total assets, since the latter use can serve as a rough measure of the "transactions demand" for cash on the part of the bank.[1] Thus, for example, a one percent increase in reserves unaccompanied by an increase in earning assets signifies an improvement in liquidity (cash) position, other things equal; while the same one percent increase, if accompanied by a ten percent increase in earning assets probably involves the opposite movement in liquidity position, other things equal, due to the increased "transactions demand" for cash.

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[1]This approach is based on Fellner, Monetary Policies and Full Employment, p. 205.

Bank reserves/assets ratios depend on the level of interest rates, then, to the extent that the level of rates affects reserves held for speculative purposes. The interest elasticity of these balances depends on the relationship between actual and "normal" rates: at relatively high rates, the elasticity of demand for reserves, given assets, is considered low; at relatively low rates, high. The reasoning behind this hypothesis is that, at relatively low rates, (1) reserves are "cheaper" in terms of income foregone, (2) the reward for bearing the risks involved in holding earning assets is less, and (3) the probability that rates will rise becomes greater. All of these reasons induce increased desire for liquid balances. On the other hand, at high rates (1) the opportunity cost of holding reserves is correspondingly high, (2) the reward for risk taking is greater, and (3) the odds shift toward increased likelihood of a subsequent fall in rates, all of which reasons discourage speculative holdings of reserves.

Fellner disputes the usual view that the speculative motive is highly responsive to interest-rate shifts.

> It does seem...very unconvincing to argue that in periods of protracted stagnation, characterized by a consistent downward trend in interest rates, a general belief in an upward trend should be one of the outstanding features of public psychology. It seems just as unconvincing to argue that a cyclical decline in net rates produces the expectation of a cyclical rise and thereby produces cyclical depression hoarding, whereas analogous expectations of a return to normalcy fail to materialize for other markets and therefore fail to bring about an actual return to normalcy....The assumptions [underlying the speculative theory of hoarding] are not logically inconsistent but they lack plausibility because they imply that the public is consistently and obstinately wrong and that a certain type of "incorrect" behavior is limited to one market.[1]

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[1]Fellner, Monetary Policies and Full Employment, pp. 150-151

The point at which Fellner's argument seems to have gone astray is in assuming that the fact that securities prices are expected to fall (interest rates to rise) is tantamount to an expectation of business recovery. It may rather indicate a belief that economic conditions will worsen so that there is expected to be a "flight to cash" with consequent depressing of prices of assets, including securities. At any rate, the weight of argument and expert opinion seem to support the view that the speculative demand for money is highly interest-elastic in the lower ranges.

Since our concern is the commercial banking firm, we disaggregate the overall liquidity-preference function and consider the "reserve preference" function of the bank.

On logical grounds, discussed above, we would expect that banks' speculative demand for reserves depends on the interest-rate level. Additional light is thrown on this relationship by certain studies that have been made attempting to verify and quantify the liquidity-preference relationship. None of the three that will be summarized here makes any pretensions to general applicability but rather purport to be merely "case studies," highly restricted as to time and space, of the use of statistical tools in this connection.

Two such studies, one by Kjeld Philip[1] and the other by H.S. Larsen,[2] analyze the liquidity behavior of Danish banks during the second World War and early postwar years. Due to considerable differences in bases used for the measure-

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[1]Kjeld Philip, op. cit., pp. 71-77.

[2]Larsen, op. cit.

ment of liquidity, the results obtained are not identical. Philip uses both "total sum of money" (i.e., notes outstanding and deposits at the Central Bank) and "that part of all cash-holdings used for speculative purposes only,"[1] the latter of which are estimated by the author. Larsen uses as measure of liquidity notes outstanding plus commercial bank holdings "of very short-dated state paper and minus the required reserves."[2] Larsen also spurns Philip's use of speculative holdings as a measure of liquidity on grounds that "In the years 1943-1946... /the banks/ were in an extremely liquid position, and it is doubtful whether they held transactions balances on top of their speculative balances."[3] - a statement of uncertain meaning at best!

Philip's analysis points to the possibility of a system of liquidity preference curves, all of similar shape, but with the curves of the later years lying successively below those of earlier years. He believes that the curves of the functions relating the level of interest rates and liquidity are "nearly right-angled, falling vertically until.../they reach/ the level of the expected future rate of interest, and then becoming more horizontal."[4]

Due mainly to a different method of measuring liquidity from that of Philip, Larsen obtains three separate liquidity preference (or reserve preference) curves, because the scatter

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[1] Philip, op. cit., pp. 74-75.

[2] Larsen, op. cit., p. 124.

[3] ibid.

[4] Philip, op. cit., p. 77.

pattern obtained from his observations of the relation between liquidity and the level of rates does not lend itself to an interpretation in terms of a single function or several very similar ones. The first curve, covering 1939-1940, is almost vertical, reflecting the fact that, during this period, wide movements of bond prices were associated with only small differences in liquidity. The 1941-1945 curve slopes downward, but Larsen believes that, in view of the circumstances that then existed in Denmark, the scatter actually covers several curves. The final curve, drawn on the basis of observations in 1946 and most of 1947, is a horizontal line.

Larsen next goes a step farther and attempts to relate expectations and liquidity. Liquidity (Larsen's concept) is measured along the X axis, and along the Y axis is measured the difference between the actual price of irredeemable Government bonds and the price expected in one and one-half years. This difference is obtained by comparing the price of irredeemable Government bonds with that of two-year State notes, admitting that this gives "only a very rough idea of expectations." His findings are that (1) "there is a definite relation between short-period expectation and liquidity preference...the greater the expected price-fall the greater is the demand for liquidity;" (2) "the demand for liquidity also appears to depend on the absolute rate of interest," presumably because of long-term expectations."[1]

The third study of bank reserve-preference is that of A.J. Brown, who studies the experiences of the London Clearing

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[1]Larsen, op. cit., pp. 126-127.

Banks during the inter-war period. This paper will be discussed below in connection with changes in the structure of interest rates; but one of his conclusions is worthy of notice here, namely, that, in comparing relative yields and relative holdings of cash and bills, "the net effect of an increase in the yield of one asset (relative to that of the other) is to increase the relative holding of it."[1]

Thus, the inverse relationship between reserve preference and the absolute level of interest rates in the case of banks seems quite well substantiated, both on theoretical and on empirical grounds.[2]

Effects on Earning-Asset Structure

A change in the level of interest rates may also be expected to have effects on the bank's earning-asset preferences, thus on its actual earning-asset structure. It might be argued that a proportionate fall of, say 20 percent in the whole structure of interest rates should not change the relative desirability of various bank earning assets. This is not necessarily the case, however. On the one hand, the need for income may influence banks to shift into "riskier"

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[1] Brown, op. cit., p. 65.

[2] It may be that savings institutions are not strongly affected in reserve-ratio policies by interest rates. According to O'Leary: "Speaking in general terms, personal trust funds, mutual savings banks, and savings and loan associations would probably have in some degree many of the same characteristics [as life insurance companies] i.e., the flow of their funds into investment is probably quite regular and uninterrupted at currently available rates without being greatly influenced by expectations of rate changes." J.J. O'Leary, "The Institutional Savings-Investment Process and Current Economic Theory," AER, (Papers and Proceedings), XLIV (May, 1954), p. 465.

assets, i.e., those entailing greater default risk; but on the other hand, the absolute difference in rates between a given risky asset and a given less risky one will have decreased, thus reducing the incentive to hold the riskier one. There seems to be no a priori reason for assuming that either effect will always prevail over the other. However, there are strong grounds for believing that a decline in interest rates will generally induce banks to shift into riskier assets, particularly if the drop in rates is not accompanied by a comparable drop in costs. Keynes, for example, mentions the threat against earning position as a reason; i.e., "a fear lest the institution [i.e., bank] may be unable to maintain its established level of income, any serious falling off in which would be injurious to its reputation. A point comes, therefore, when they hasten to move into long-dated securities."[1] According to Livingston, "Generally, low interest rates cause a tendency toward lower borrowing standards which lead to an overextension of credit."[2] Wallich, writing at the close of World War II, claims that at low interest rates

> lenders are forced to reach out for less secure investments in order to obtain what looks like a good return. There is some evidence that many smaller banks, accustomed to high rates of return and not favored by large deposit increases, have been forced to reach out in this manner and have thereby weakened their position.[3]

During the 1930's, banks in considerable numbers entered novel (for them) fields of lending. The influence of

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[1] J.M. Keynes, A Treatise on Money, (New York: Harcourt, Brace & Co., 1930), II, p. 358.

[2] Livingston, op. cit., p. 27.

[3] Henry C. Wallich, op. cit., p. 785.

low earnings was mentioned by Jacoby and Saulnier as a factor in this development.[1] However, whether the low earnings induced banks to assume higher risks associated with these new types of loans or simply to reassess the risks and costs involved, or both, is a moot question. Evidence presented by the above authors lends to the inference that the correct answer is "both;" but there were so many influences operative in that period - legal, economic, and psychological - that it seems impossible to isolate any one of them for purposes of identifying its influence.

A final citation is taken from Whittlesey:

> Differences in policies with regard to liquidity appear to be influenced in some degree by the earnings position of banks....A bank that anticipates a decrease in earnings may, for that reason alone, assume a less liquid position, while another whose earnings outlook is satisfactory may remain as liquid as before.[2]

Thus, there seems to be general agreement, so far as the author has been able to discover, that lowered yields induce the carrying of a higher-risk asset-mix.[3]

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[1] Jacoby and Saulnier, op. cit., pp. 166-167.

[2] Charles R. Whittlesey, Bank Liquidity and the War (New York: National Bureau of Economic Research, Inc.,1945),p.6.

[3] That this phenomenon is not limited to the field of banking is attested to in this quotation from United States Congress, Joint Committee on the Economic Report, Monetary Policy and the Management of the Public Debt (Washington: Government Printing Office, 1952), II, p. 387: "The current level of interest rates has great effect on the demand for government securities by life insurance companies, since the contractual obligations of the companies require them to obtain a certain average return on their entire portfolios. When the current yield on Government bonds is not sufficient to meet this requirement, life insurance companies necessarily look more aggressively for other forms of investment to provide higher returns. Thus when yields are low relative to need for income, insurance companies' demand for Government securities will tend to diminish and their demand for other types of securities and for mortgages will increase. When yields are high, insurance companies tend to be more willing to buy government securities and to retain those they already hold."

CHAPTER VI

GROSS YIELD: INTEREST RATE STRUCTURE

The pattern of interest rates is constantly changing, and there are strong reasons why this should be the case. First, certain factors operating on the supply-of-funds side affect the pattern. These factors include (1) changes in expectations of future interest rates, as a result of which the relations between yields on securities of different maturities (the well-known "yield curve") are altered; (2) changes in relative risks, or in the assessment of these risks; (3) changes in relative costs associated with individual types of earning assets; and (4) changes in relative legal or "social" status of assets. Second, there are important forces affecting relative demands for funds, both within the business sector and among various sectors of the economy - business, households, and government.

Changes in the structure of business demand for credit have been extensive in recent decades. For example, according to Jacoby and Saulnier, during the 1923-1928 period:

> the /business finance/ function was met increasingly through the purchase and holding of private corporate securities and the extension of credit on the security of stock exchange collateral and real estate mortgages and, relatively speaking, decreasingly through the extension of business loans of traditional form..../This/ behavior of bank assets reflects shifts during those years in corporate asset structure and financial policy.... All these changes seem to conspire against the growth of short-term credit and to promote the more extensive use of medium- and long-term funds, in the form of debt or equity.[1]

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[1] Jacoby and Saulnier, op. cit., pp. 107-108.

Changes in consumer and government demand for credit are too familiar to justify elaboration here.

Effects of Structural Changes on Asset Preferences

The effects of these demand and supply changes on interest rates actually received by the banks at a given time depend on the many influences affecting both the extent and the speed of response to changes in the credit environment. The intent is to examine these influences in the course of this chapter; but before this is done, we face the more immediate question of the effects of rate-structure changes on the bank's preferred asset-mix.

It would seem obvious that an increase in the yield of one earning asset relative to others would induce an investor, bank as well as nonbank, to regard that asset more favorably and, cet. par., to shift his portfolio in that direction.[1] However, the notion seems to persist that banks have some ideal asset-mix which they strive to attain regardless of relative rates. A.J. Brown, although noting this view in banking literature, reached conclusions quite contrary to it in his study of the London Clearing Banks already referred to at several points above. His methods and results are worthy of some attention in this connection. As quoted earlier, his study was "an attempt to see if the 'liquidity-preference schedule,' which Mr. Keynes has introduced...can

[1]There also exists the theoretical possibility that, at extremely high levels of earnings, a rise in the yield of high-interest, high-cost assets will induce a shift in the direction of other assets. The bank would thereby sacrifice some added income for the added safety of lower-yield but less risky assets.

be used in this field as an instrument of statistical analysis."[1] However, the paper does not merely take up the relation between reserve holdings of banks and the rate of interest but rather looks at the whole balance sheet and relates changes in the structure of yields (interest rates) and changes in the total quantity of the banks' assets to changes in the structure of assets, including reserves. For present purposes, we concentrate on the relation between yields and the asset structure.

Brown divided the assets of the London Clearing Banks during the 1921-1936 period into four groups - "cash" (including "short loans"), bills discounted, investments, and advances - and then paired the first two and the last two. He then compared, using the method of multiple correlation, the log of the ratio of cash to bills (called the "asset-variable") with the log of the ratio of their prices (the "yield-variable") and the log of the total holdings of cash and bills (the "resources-variable"). The same operation was performed on investments and advances; i.e., the log of the investments/advances ratio compared with the log of the ratio of their prices and the log of total holdings of the two types of assets.

His findings with respect to the first two of these are summarized briefly:[2] a "very high" correlation was found between the asset-variable and the yield-variable in the case

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[1] Brown, op. cit., p. 49.

[2] The findings concerning the relationship between the yield-variable and resources-variable are discussed in Chapter XI, on "Size."

of the cash-bills comparison. An even higher correlation between the asset- and yield-variables was found in the case of the investments-advances comparison. Commenting on these two results, Brown states:

> The general forms of the schedules found for both parts of the banks' balance-sheets, therefore, are very much what one would expect a priori. At the same time it must be admitted that the statistically highly significant influence of the yield-variable on the asset-variable...is a factor of which bankers seldom admit their awareness.[1]

The same view of the portfolio effects of rate-structure changes is taken by Jacoby and Saulnier in their study already referred to. They explain the rise during the 1930's of consumer lending and a greatly broadened array of devices and techniques for lending to business in these words: "The fact that these institutional adjustments took place in the thirties and not in the twenties may be explained in large part by the different levels of bank earnings in the two periods and by the growing discrepancy between earnings on loans and earnings on investments.[2] Changes in both the rate structure and (indirectly) the rate level are thus credited with the revolutionary changes of the thirties in bank earning-asset portfolios.

This is not meant to imply that banks did not respond to changes in relative rates in earlier times, however. A quotation from Ernest Shaw concerning the 1920's picture is enlightening in this connection:

> The smaller country banks carried no money on call as a general practice although the high rate prevailing in the summer of 1929 had induced many of them to do so at that time....Banks in the larger cities invariably

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[1] Brown, op. cit., p. 69.

[2] Jacoby and Saulnier, op. cit., pp. 166-167.

> carried money in the call market. The amount thus invested varied with the call rate.[1]

Behavior of mutual savings banks in this respect follows the same pattern, judging from the following:

> Changes in mutual savings bank portfolios can...be expected primarily to reflect changes in two factors: (a) relative available supplies of different legal investments...and (b) relative rates of return available on different types of legal investments after allowing for investment expenses and any marked change in the bankers' judgments of the relative degrees of risk involved. The actual record of their investment holdings since 1920... indicates that savings banks' investment policies have in fact been dominated by these two considerations, with the significant exception of the relative volume of mortgage lending from 1935 or 1936 on through 1944 or perhaps 1945.[2]

Evidence is thus quite unmistakable in pointing to the conclusion that relative rates on earning assets influence their relative importance in the bank's portfolio.

It is of interest to attempt to translate these results into the framework of the elementary model of the bank developed in Chapter IV. Other things the same, a relative increase in loan rates may be expected to raise the preference structure depicted in the Basic Diagram (Figure 4), the rise at each point being roughly in proportion to the L/A ratio represented there. We would therefore expect the greatest increase at the point where the loans/assets ratio is 1.00, with no increase at all along the X axis, where L/A is zero. Point P would move approximately upward because of this "tilt" in the preference surface, but - and here is the problem not

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[1] Ernest R. Shaw, "The Investment and Secondary Reserve Policy of Commercial Banks," (Unpublished Ph.D. dissertation, University of Chicago, 1930), p. 139.

[2] John Lintner, Mutual Savings Banks in the Savings and Mortgage Market (Cambridge: Harvard University Press, 1948), p. 216.

touched upon in any of the empirical studies cited - there is no means of determining what will tend to happen to the R/A ratio. Forced into a priori reasoning, we must theorize that if loans are considered the riskier class of earning assets, the new point P will shift to denote a higher R/A ratio, and if the less risky class, P will describe a lower R/A ratio. However, whether loans or investments are considered the riskier earning asset to hold depends on economic circumstances, especially current and expected business conditions, the markets for various assets, and the policies of the Federal Reserve. A rise in the interest rates on investments will tend to tilt the preference surface so that I/A=1.00 rises most, I/A=0 rises not at all, and point P moves approximately to the right. Again, for the same reasoning as given above, the effect on the preferred R/A ratio is not predictable. On the basis of the foregoing, the reader can easily ascertain the effects of a fall in i_L relative to i_I, or vice versa, on the preference pattern under alternative assumptions as to the riskiness of loans versus investments.

Determinants of a Loan Rate Change

Interest rates on various classes of earning assets are determined in a general way by supply and demand factors; but the exact path of reaction - the amount and speed of rate change - depends on a variety of influences. In this discussion, we concentrate on the determination of interest rates on loans since in this area, in contrast to the markets for most open-market securities, the individual bank does not simply adjust its portfolio to given rates but generally has some degree of

latitude in determining rates on its loans. Our concern is with those elements in its environment that influence the bank's loan rate decisions. Recognizing, however, that the bank's response may take other forms beside rate changes, we devote the following section to these alternative types of responses.

In what follows it is assumed that there has been a change in demand for a particular kind of credit accommodation. The various factors to be discussed are influences on the way the bank responds. This assumption is made only for expository convenience; obviously, a change in any one of these factors could affect the rate charged on a loan or class of loans, demand remaining the same.

Loan Rate Flexibility and Market Structure

An individual bank may be a monopolist in some loan transactions, an oligopolist in others, and one seller among many in an imperfect loan market with respect to still others. The degree of imperfection in the market for a given class of loans is an important determinant of the interest-elasticity of demand for loan accommodation. Taking the short-range view, the bank has considerable latitude in the rates charged some of its customers, to which it appears as a monopolist, and virtually no latitude in rates charged those who have a large number of alternative sources of funds. This does not imply that rates will be less stable in the former case. On the contrary, since the impetus toward a change in rates comes from "outside" market forces, and since there may be strong internal forces working against rate changes, freedom to change rates means, in practice,

freedom not to change them. Or, stated differently, those rates that are rigid really change to the greatest extent in relation to the general course of interest rates.

It is practically inevitable that the market for a given category of loans be characterized by some degree of imperfection. This follows from the nature of the loan itself and from certain other elements involved in the loan market. In order to clarify this point, consider the requirements of perfect competition and the extent to which loan market situations conform or fail to conform to them. These requirements are (1) a homogeneous commodity or service; (2) a large number of buyers and sellers, no one of which can appreciably affect price; (3) full knowledge on the part of participants of market conditions and opportunities; (4) each participant acting independently; (5) free entry and egress; and (6) absence of government interference with the pricing process.[1]

The first requirement of a perfect market is a homogeneous or standardized commodity or service. "There must be nothing about the good itself, the circumstances under which it is sold, or the personality or the seller, which would lead the buyer to prefer the product of one seller over that of another."[2] That this requirement nearly always fails of being met is too obvious to justify extended discussion. Given the

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[1]The following discussion relies strongly on Lester V. Chandler, "Monopolistic Elements in Commercial Banking," JPE, XLVI (February, 1938), pp. 1-22; and David A. Alhadeff, "The Market Structure of Commercial Banking in the United States," QJE, LXV (February, 1947), pp. 62-86.

[2]Chandler, op. cit., p. 2.

size of the loan, there are many characteristics of the loan contract itself that are subject to variation. For example, consider this list: (1) type of security required, (2) collection policy and procedure, (3) schedule of payment, and (4) method of charge.[1] Beside the terms themselves, there are other reasons for preferring one lending institution over another, such as (1) age of bank and reputation for fair dealing, honesty and safety, (2) courtesy and personalities of bank employees, (3) location, size, and architecture of the building, and (4) social and financial standing and affiliations of the bank officers and directors.[2]

A second requirement of perfect competition is that the number of buyers and sellers be large enough, and each participant be of such size, that no single buyer or seller can influence price measurably. This requirement is not often met on the sellers' side. In 1949, Alhadeff found that 75 percent of localities having banking services (unit bank or branch) had only one such outlet; 52.8 percent of banking offices were the only banking agency in their localities.[3] This tends to give an exaggerated impression of the extent of monopoly power, however, in two respects. First is the number of potential alternative bank sources of supply of loan funds, which may be larger than a mere count of banks within the locality itself would indicate. For example, a recent study of banking facili-

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[1]Clyde W. Phelps, "Monopolistic and Imperfect Competition in Consumer Loans," Journal of Marketing, VIII (April, 1944) p. 383.

[2]Chandler, op. cit., p. 3.

[3]Alhadeff, QJE, LXV (February, 1951), p. 64.

ties in the Second Federal Reserve District undertaken by the Federal Reserve Bank of New York found that, for all municipalities having a population of 14,000 or more, "In every case there are additional commercial banks within a relatively short radius."[1] Of course, borrowers - small ones at least - in less thickly populated areas are less favored with potential alternatives. The second respect in which the number of banks in a locality may give a distorted picture of monopoly concerns the existence of nonbank sources of supply of credit. In the business credit area, commercial finance companies, life insurance companies, and factors are among private nonbank sources,[2] while the Federal Reserve, Veterans Administration, and the Small Business Administration are Federal agencies having authorization to grant loans and participate with banks in granting loans to businesses under stipulated conditions. In the field of consumer credit a similar situation exists, with several types of financial agencies set up to cater to consumer desires for credit.

Even where there are several bank and nonbank sources of funds in or near a locality, the small business borrower there may be effectively deterred from utilizing at least the other banks because of the cost of time and transportation involved, the cost of credit investigations, chance of weakening his credit standing at his own bank, and the likelihood that

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[1] U.S. Congress, Joint Committee on the Economic Report, op. cit., II, p. 745.

[2] The fact that these sources are, in turn, dependent on banks for their supply of funds is beside the point in this connection, since we are looking at the situation from the standpoint of the ultimate user of credit.

another bank, not being familiar with his circumstances, may be inclined to overestimate the risks involved. Nonbusiness borrowers may have more actual alternative sources of credit; but here, too, there are hardly enough to meet the "large numbers" requirement. An additional consideration is that in some cases, although there may be many lenders, one firm may be dominant, as, for example, the Federal government is in the market for certain types of agricultural loans, particularly farm mortgage loans[1] and those made by the Production Credit Associations. Commenting on the latter type, Alhadeff states:

> Loans made by the Production Credit Association are effective substitutes for many bank agricultural loans, and, therefore, bank rates on such loans must compete with Production Credit Association rates....[For] loans of "moderate" size, Production Credit Association rates establish not only the ceiling but the actual rates at which commercial banks...actually lend in normal operations.[2]

A further requirement of perfect competition that is not generally met, and probably cannot be, is full knowledge, by both sides, of market conditions and opportunities. Banks may deliberately keep knowledge from customers by discouraging their calling on other banks and by quoting charges in such a way that it is next to impossible to compute the actual interest rate.[3] Borrowers may also lack information as to alternative sources and their terms due to the difficulty of getting such information and due to inertia. Lenders, on their part, may

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[1]Neil H. Jacoby, "Government Loan Agencies and Commercial Banking," AER (Papers and Proceedings), XXXII (March, 1942), p. 253.

[2]Alhadeff, Monopoly and Competition in Banking, p. 126.

[3]This seems to be especially characteristic of consumer lending institutions. Cf. Yntema, op. cit., and Phelps, op. cit.

lack adequate knowledge of market opportunities, causing them to assess risks and demand conditions incorrectly.

A fairly recent example of bank reaction to market uncertainty is contained in this quotation from an article by R.P. Chapman, in which he is discussing the 1952 credit picture:

> A general rate increase last fall would have been opportune, as it appears by hindsight. The opportunity was lost through hesitation when the normal seasonal increase in credit, which finally came in full flood, was slow in coming. The result was that, despite a sustained heavy demand through the winter, bankers held back because of the approach of normally slacker demand periods and a general belief that inflationary pressures might ease and thereby reduce credit demands.[1]

Lack of knowledge as to the true risks involved in certain novel types of credit arrangements is one factor responsible for the slowness exhibited by banks in imitating certain innovations, such as the term loan. In fact, Hart makes the point that, because of uncertainty, perfect competition is inherently impossible in most sectors of the market for funds:

> A commodity market is at least theoretically capable of "pure competition;" the common fund of knowledge we have to attribute to dealers in assuming pure competition is all knowledge about the present. But the knowledge dealers must share to admit of pure competition on the capital market is knowledge about the future. Thus it is inherently uncertain, and the uncertainty extends to the proceeds of transactions currently engaged in. This uncertainty unavoidably makes competition on the capital market "impure." Segments of the capital market, dealing in especially well-secured short term debts, have sometimes been marked off on a basis that admitted of pure competition...But these islands of certainty have been raised above the flood only by intensifying uncertainty about junior debt securities and about equities in the firm whose debts came in question.[2]

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[1] R.P. Chapman, "The Banker's Dilemma," HBR, XXXI (July-August, 1953), p. 56.

[2] Hart, AER (Papers and Proceedings), XXXIX (May, 1949),

A fourth requirement of perfect competition is absence of collusion. The existence of clearinghouses facilitates united action by the banks of a locality. In 1900 James G. Cannon wrote this about clearinghouses:

> /Though/ originally designed as a labor saving device, the clearinghouse has expanded far beyond those limits, until it has become a medium for united action among the banks in ways that did not exist even in the imagination of those who were instrumental in its inception....The tendency has been marked, especially in recent years, to include within the legitimate field of clearing houses all questions affecting the mutual welfare of the banks and the community as a whole.[1]

The extent of actual collusion in the setting of schedules of loan rates is probably not great, according to Chandler. Such an agreement could not be enforced upon large borrowers with out-of-town alternatives and would be unnecessary for borrowers without outside sources in that large number of cases in which the rates are fixed by custom of long standing - this customary rate often being the maximum legal rate.

> Often...banks co-operate to prevent customers from "playing off" one local bank against another in order to secure a reduction from the customary rate..../The/ device /of interbank exchange of credit information/ has been used at times...to prevent customers from "shopping around." The aim is to force each customer to confine his patronage to one bank.[2]

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pp. 171-172. Hart includes perfect knowledge among the attributes of pure competition. However, cf. E.H. Chamberlin, The Theory of Monopolistic Competition, (4th ed.; Cambridge: Harvard University Press, 1942) p. 6; and Frank H. Knight, Risk, Uncertainty, and Profits, (Boston: Houghton Mifflin, 1921), p. 193.

[1]James G. Cannon, Clearinghouses: Their History, Methods and Administration, (New York: D. Appleton & Co., 1900) pp. 1,11.

[2]Chandler, JPE, XLVI (February, 1938), pp. 13-14.

Still another device used for collusive purposes is bankers' associations.[1]

Freedom of entry, the fifth requirement, is limited by the difficulty of acquiring a bank charter or permission to establish a de novo branch. In another sense, however, freedom of entry may be somewhat greater. That is, an existing bank may find it comparatively easy to enter a new market, e.g., the automobile financing market or the home improvement loan market or even the trust banking business. Freedom of exit may, in practice, be impeded in the case of participants in the mortgage market by the illiquidity of some types of mortgages.[2] This factor has been reduced in importance in recent years because of development working toward an organized secondary mortgage market, notably through the discount facilities of the Federal Home Loan Bank and the activities of the Federal National Mortgage Association.

The final requirement, absence of government influence on prices, is violated by usury laws and small-loan legislation, which often have the effect of setting the actual rates for certain classes of loans, and by government competition.

The unlikelihood of perfect competition in the various markets for loans having been established, and hence the existence of some degree of freedom of rate policy on loans, there

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[1]Marjorie D. Poston, "Bank Earnings and Their Effects on the Banking Structure and Banking Practice, 1926-1939," (Unpublished Ph.D. dissertation, Ohio State University, 1941), p. 267.

[2]Paul M. Gregory, "Imperfect Competition in the Mortgage Market," Southern Economic Journal, V (April, 1944), p. 290.

is still the question of why banks choose to maintain rigid rates on some classes of loans and to change rates on other classes relatively slightly despite rather substantial changes in the general credit environment.

In the case of loans to large borrowers with access to alternative sources of supply, the bank has little choice but to lower its rates if it is to retain its choice customers when open-market and/or prime rates fall. If the bank were to maintain the old rate schedule for these customers it would find demand for such loans substantially cut due to the high interest-elasticity of these loans with respect to the individual bank.

Taking the opposite situation - the small borrower-customer - the bank will find that, despite a drop in the prime loan rate, the demand for these loans as seen by the individual bank will remain quite steady due to a lack of alternative sources of supply. It is conceivable, however, that the bank may be induced to cut rates on small loans for other reasons, to be enlarged upon the next section.

Between these two extremes are the borrowers who have, or may be induced to seek out, alternative sources of supply. For the bank, the problem is a marginal one in nature - to achieve that degree of rate reduction for each type of loan (or each loan) that will just balance the loss of utility due to reduced income per loan dollar with the gain in utility resulting from greater loan volume, retention of customer and community good-will, and perhaps other intangibles that influence such decisions.

Also relevant is the outlook as to rivals' reactions

in the case of oligopolistic situations characteristic of nearly all foreign banking systems and that of California, where branch banking is the rule, and also of localities where there are several banking offices. In these situations, according to Alhadeff:

> /The/ price of customer loans is stabilized (...at the customary or fair price) by a recognition by the oligopolists of their mutual dependence, or, in certain instances, by outright collusion in the form of informal agreements and understandings. At the stabilized price thus achieved, each of the oligopolists faces a kink in his demand schedule.[1]

This is not to imply that wherever there is fewness of sellers on a given loan market there will be an immutable rate structure. Rather, there are circumstances in which we can expect some rate changes. For instance, when the prime rate rises, banks in oligopolistic situations may anticipate that, even in the absence of collusion, a rate increase will be matched by rivals. Also, during periods of economic decline there is a tendency for the price structure to yield through secret price concessions. This tendency is facilitated in the banking field by the secrecy attending loan transactions. Thus there seem to be situations in banking in which, even where the market structure is oligopolistic, the kinky demand curve analysis may be misleading.

Other Determinants of Loan Rate Changes

The market structure determines the range within which the bank is ostensibly free to set its rates on particular loans. Other factors, however, may seriously limit the bank

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[1] Alhadeff, D.A., Monopoly and Competition in Banking, p. 170.

in the exercise of its rate-making powers. In this section some of the more important of these factors are discussed.

First, the bank, in common with other institutions having a degree of monopoly power, is aware of certain possible reactions which might have adverse long-run implications: loss of customer good-will, inducement on the part of some present customers to exploit other sources of funds, public antagonism, and perhaps new entrants on the supply side of the market. As Robinson put it:

> The policy of the bank...must always stand the test of fairness....A banker must follow reasonably well the pattern of society and of the business community in which he lives; his rates need "to be in line with those of other banks similarly located and possibly directly competing." Even if the competition is not too close or direct, the bank still may be ill-advised to maintain rates that irritate his customers and engender a feeling of exploitation.[1]

Second, and closely related to the foregoing, the bank will be influenced by what is happening to other rates: those charged by other banks, those it pays on deposits, rates in the open market, and the Federal Reserve rediscount rate.

A change in the so-called prime rate - the rate on loans to large, sound borrowers with national connections and often with access to the open money markets - may have widespread effects.

> The prime rate is the key rate in the whole interest rate structure....For banks all over the country, the prime rate is determined under a system of price leadership in which the leadership rotates among the large New York City banks whose operations involve them constantly in the open money markets....Occasionally the initiative is taken by a large bank in Chicago.[2]

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[1]Robinson, op. cit., pp. 116, 123-124. Robinson gives no indication of the source of the quotation in the above passage.

[2]Alhadeff, Monopoly and Competition in Banking, p. 143.

The change in the prime rate is regarded as a signal, indicating that conditions are suitable for a general change in the structure of loan rates. Banks in oligopolistic situations may hesitate to change rates unilaterally, even though the environment may call for a change; but the prime rate shift may be regarded as the impetus which will induce the rate movement called for by the change in money-market conditions. Of course, the speed and magnitude of change in a given situation will depend on the market structure and the other variables under discussion.

Rates paid on deposits exert a similar influence. Robinson states that:

> When banks have to pay, directly or indirectly, a fairly high price to attract funds from depositors, they are certain to feel compelled to charge borrowers correspondingly high rates. When banks get deposits easily and at low cost (or assess some of the cost of deposits back on deposit accounts as by service charges), then they are disposed to lower loan rates.[1]

Open-market rates may influence loan rates in this way. Taking the case of a general rise in demand for credit, "As open-market rates rise, the cost to banks of funds to meet the credit demands of their customers is increased, and the rates they charge customers will also increase."[2] Or, taking the opposite situation, as open-market rates decline in a time of diminished demand for credit, it seems likely that the higher return on loans will appear more attractive and induce a general loan rate reduction.

Of course, in both cases, risk considerations affecting

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[1]Robinson, op. cit., p. 116.

[2]Smith, op. cit., p. 595.

loan rates must not be ignored. When credit demand is brisk and optimism characterizes business attitudes, the bank may be prone to demand less in the way of risk premium as an element in the rate charged. When demand is slack and business prospects seem gloomy or uncertain, the risk attached to lending may make the rate differential seem less attractive. To further complicate the picture, higher yields may cause the bank to have a lower risk-preference while lower yields may induce it to "reach for yields" by assuming a riskier position. We cannot be sure which influence - the change in estimation of risk or the change in attitude toward risk - will prevail; but these additional influences are not to be neglected.

The effect of the rediscount rate on loan rates has both direct and indirect aspects. An example of a direct effect is the fact that "a common clause in term loan contracts provides for interest rate changes on a sliding scale with discount rate changes."[1] Indirectly, such a change may trigger, or at least influence, a change in the prime rate. Or, by creating or alleviating uncertainty as to Federal Reserve policy, it may influence, at least temporarily, the availability of loan funds.[2]

Cost structure changes constitute a third factor affecting rates charged. The following is an example of such a change and the resulting impact on rates on loans affected by the change:

In California, where it was provided that the mortgage

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[1]Alhadeff, Monopoly and Competition in Banking, p. 168.

[2]See the following section for discussion of availability.

> should be taxed in the locality where the mortgaged property is situated, and that if the mortgagor paid the tax he might recoup it from the mortgagee, agreements to the contrary being void, it has been shown by careful statistical investigation that after the enactment of the law the interest rates on mortgages, as compared with other classes of investment, rose, not only by the amount of the tax, but by a slight sum in addition.[1]

Custom and tradition with respect to loan rates exert a definite effect on rates in certain loan-market situations, making for a high degree of rigidity. "For many lesser customers and in small country banks rates have been observed to possess an almost unbelievable stability. There the interest rate appears to be not so much a price as an integral part of a business relationship."[2]

Another set of influences on rate-determination is the existence and desirability of alternative actions. The rate is, after all, only one term in the contract; and changing rates is only one means of increasing or decreasing the loan portfolio. This, however, is a big topic and will be given its due attention in the following section.

Also affecting the course of rate changes following a change in demand is the relationship between the bank's preferred and actual loans/assets ratio. In terms of the Basic Diagram, if point P is considerably above the loan-demand line (KL), the marginal utility of increments to the L/A ratio is

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[1]Edwin R.A. Seligman, The Shifting and Incidence of Taxation, (4th ed.; New York: Columbia University Press, 1921), p. 334. The study referred to is that of Carl C. Plehn, "The Taxation of Mortgages in California," Yale Review, VIII (1899), pp. 31-67.

[2]Henry C. Wallich, "Recent Monetary Policies in the United States," AER (Papers and Proceedings), XLIII (May, 1953), p. 38. Also see Alhadeff, Monopoly and Competition in Banking, p. 121.

greater than would exist if P were near KL. For example:

> If the banks have just passed through a period in which the demand for loans was relatively low so that initially their short-term investments are unusually large in relation to their loans, they may be so anxious to expand their loan portfolios that they may not begin to pass on the increase in the cost of funds (resulting from the rise in open-market rates as they liquidate secondary reserves) to their borrowing customers.[1]

Finally, we simply list a few other factors which bear on interest rates charged as of a given time: "resistance to /rate/ variation unless the new level looks fairly stable... reluctance to create cost differentials between outstanding and new loan contracts."[2] and usury statutes.

Supplements to Loan Rate Changes

Several kinds of responses to a change in demand for credit are possible on the part of the bank, as noted above. Changing the rates charged on loans is one response; this was discussed in the foregoing section. Now it is proposed to examine the more important supplements: credit rationing and changing the availability of credit, changing the standards required of an acceptable loan, changing the non-interest terms of the loan agreement, and changing the bank's activities in the field of nonprice competition.

Credit Rationing and Availability

The concepts.--A sizeable literature has grown around the related terms "credit availability" and "credit rationing," but writers do not always agree on the definitions of these terms. In the case of credit rationing, the term has sometimes been used to designate the changing of credit standards:

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[1]Smith, op. cit., p. 596.

[2]Wallich, AER (Papers and Proceedings), XLIII(May, 1953), p. 38.

> Those borrowers who could pay the required rate of interest but who are excluded by the lenders' credit standards have been called the "unsatisfied fringe," to distinguish them from borrowers (or from excluded buyers in other markets) who cannot demand because the price is too high; the process of applying the decisive credit standards has been called "credit-rationing," and its effects on the supply of credit (or money in the broad sense) has been designated as its "availability," to distinguish this factor from the limitations imposed by the rate of interest.[1]

Another usage distinguishes it from the changing of credit standards, as evidenced by this quotation: "The commercial banks will not only tighten the conditions under which they themselves grant credit to business but they will also often resort to credit rationing."[2] The present author objects to the use of the term rationing in the former sense on grounds effectively stated by Marget:

> Banks may always be said to be "rationing credit," in the sense that they are always selecting from a "fringe of unsatisfied borrowers" - to use Mr. Keynes' phrase - those to whom they are prepared to lend at any given rate of interest. In this sense, obviously, manufacturers and dealers in ordinary commodities might also be said to be "rationing" their goods at all times, since ordinary counsels of prudence will force them to refuse goods to those whose credit standards are unsatisfactory, and to favor those customers whose credit standing is of the highest.[3]

For our purposes let credit rationing be defined as the allocation of credit on a basis other than by price alone, in a situation where there is demand for more credit by acceptable borrowers than the amount of credit available. This definition

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[1]Howard Ellis, "The Rediscovery of Money," in Money, Trade, and Economic Growth, (New York: The Macmillan Co., 1951), pp. 255-256.

[2]Fredrich A. Lutz, "The Interest Rate and Investment in a Dynamic Economy," AER, XXXV (December, 1945), p. 829.

[3]Arthur W. Marget, The Theory of Prices (New York: Prentice-Hall, Inc., 1938) I, pp. 224-225.

excludes the raising of standards, since such a practice involves reducing demand through reducing the quantity demanded by "acceptable" borrowers, by eliminating some applicants and cutting the amount of credit for which others can qualify. Price changes are admitted, but the phrase "other than by price alone" indicates that prices are not performing the allocative function unassisted.

A similar definitional problem exists in the case of credit availability. Some writers seem to use it to refer to total credit, as indicated in the above quotation from Ellis and in the following quotation from Musgrave: "A change in the 'availability of credit' evidently means a shift in the credit supply schedule."[1] Other writers use the term to refer to the credit allocated to certain classes of assets, generally loans of various degrees of risk. Ira O. Scott, in summarizing the "Elements of the Availability Argument," states that

> "the immediate effect of central bank action /in raising the prices of assets of types held by both central and commercial banks/ is to increase the riskiness and illiquidity of the investor's portfolio. This leads to an increase in demand for relatively riskless or liquid assets, namely, government securities....The relative increase in the demand for government securities implies a relative decrease in the demand for the more risky private securities."[2]

In this paper, we use the term in the latter sense. Availability of credit thus refers to its allocation to loans, as opposed to other uses, and among various risk-classes of loans;

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[1]Richard A. Musgrave, "Credit Controls, Interest Rates, and Management of Public Debt," in Income, Employment and Public Policy, Essays in Honor of Alvin H. Hansen (New York, W.W. Norton Co., 1948), p. 227.

[2]Scott, op. cit., pp. 38-39.

rationing, to its allocation within various categories of loans among prospective qualified borrowers on a basis other than price.

The problem of availability is thus distinct from the problem of credit rationing. Since the former involves the whole complex of determinants of the distribution of the bank's assets among loans, investments, and reserves and their subdivisions, it is, in effect, dealt with throughout this whole part. However, the term is usually used in connection with the effect of Federal Reserve actions on bank asset-preferences, particularly via influence on risks, so it will be appropriate to emphasize it in Chapter VII. Credit rationing seems to involve the question of alternative means of allocating credit; therefore, it is a suitable topic for inclusion here.

Reasons for credit rationing.[1]--Loan markets being characterized by varying degrees of monopoly, rates do not change automatically but only as a result of conscious decisions by individual banks or groups of banks acting together. Quite naturally, therefore, when demand for loans expands substantially and the banking system does not have large amounts of excess reserves, there may be a subsequent period during which the amount demanded exceeds that offered at going rates.[2] To

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[1]The situation directly opposite of rationing, where the loan rates lie above equilibrium, also may arise but need not be discussed separately since the causes of its appearance and the determinants of its eventual correction are essentially the same as those involved in credit rationing.

[2]If, at the same time, the Federal Reserve authorities are acting, or are expected to act, to restrict bank lending through general credit weapons, the preference of the bank for loans may also be curtailed. See Chapter VII.

paraphrase Friedman,[1] there may be a lag between a change in market conditions and recognition of this fact by the banks. Then, there may be a lag between recognition and changes in rates, due to factors discussed in the foregoing section. Since open-market yields will normally have risen, adjustment by means of allocating more funds to loans - i.e., increasing "availability" - will be impeded by reluctance of banks to take capital losses resulting from selling securities on a depressed market.

Evaluation.--The importance of this phenomenon may be questioned on at least two grounds: (1) its ultimate (as opposed to impact) effect on rates and (2) the value of the concept as a piece of theoretical apparatus. The first of these grounds was forcibly presented by Samuelson before the Patman Committee:

> Now it is unthinkable that over a period of time, of a few months, let us say, or of over a year, or more than a year, that a banker should act so irrationally that when credit is scarce he will hold his rates perfectly inflexible, and arbitrarily make trouble for himself by refusing solid citizens in the community, and some who think they are solid citizens, credit, and thereby bringing upon himself all the troubles that can come from rationing.
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> On the contrary, it seems to me that after the shortest run, what he will do will be what any normally prudent commercially minded man would do; namely, if a thing is in short supply, he will gradually raise the interest charges on it, and let the higher price help him do the rationing.[2]

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[1] Milton Friedman, "A Monetary and Fiscal Framework for Economic Stability," AER, XXXVIII (1948), pp. 254-258.

[2] Monetary Policy and Management of the Public Debt, hearings before the Subcommittee on General Credit Control and Debt Management of the Joint Committee on the Economic Report (Washington: 1952), pp. 694-695. Also see Wallich, AER (Papers and Proceedings), XLIII (May, 1953), p. 38, and Smith, op. cit., pp. 593-596.

Samuelson perhaps underrates the importance of factors slowing - even preventing - rate adjustments, but nevertheless his point is a valid one, particularly with respect to rates on loans in markets characterized by some degree of competition, as evidenced by the course of interest rates on loans during the recent "tight-money" era.

With reference to the second point, the value of the concept of "credit rationing" as a theoretical construct is open to serious doubt. It smacks of attributing irrational behavior to the bank, as Samuelson brought out in the above quotation. It is a "traditional evasion," as Hicks would say, a "friction" which is recognized, to be sure, but not integrated into the main body of theory.[1] The present author maintains that, rather than simply using the term "rationing" as a sort of deus ex machina, efforts should be made, perhaps along the lines of this study, to understand the reasons for this phenomenon and integrate it into the theory of the bank.

Changing Credit Standards[2] and Terms Other Than Interest

Chronologically following, and to a degree replacing, rationing as a means of allocating scarce funds among prospective borrowers are the raising of standards necessary for an applicant to qualify for a loan at all or of a certain amount and the stiffening of non-interest terms in the loan contract.

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[1] Hicks, op. cit., p. 6.

[2] Attention is again called to the fact that some writers refer to this phenomenon as "rationing."

Rationing is automatic, but raising credit standards and imposing more onerous terms upon the borrower require decisions. When these latter two are utilized, the amount of loan funds requested by "acceptable" applicants is cut and rationing is thereby less drastic and perhaps eliminated entirely.

Note that an action of this kind does not imply that the rejected loan applications are considered more risky than they formerly were.[1] Rather, the bank faces a situation in which it can increase yields and/or decrease risks through (1) raising standards, (2) raising rates, and (3) stiffening the terms of the contract, a device which exhibits characteristics of both of the first two.

The rationale of raising standards for qualifying as a borrower is given by Wallich:

> It is not agreeable for the banker to feel that he is leaving legitimate credit needs unfilled. There is a tendency, therefore, when credit becomes scarce, to screen out some of the applicants on the basis of more rigorous credit standards and to regard them as no longer creditworthy. In that way, what is really a limitation of the supply of credit is made to appear as a limitation of demand - and the bank is still meeting all legitimate credit needs. A corollary of this reinterpretation by the banker is that he has less incentive to raise rates than if he viewed the situation in terms of unsatisfied excess demand.[2]

Under the opposite set of conditions, the banks may be induced to

"comb the market" more thoroughly than before. They may

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[1] In some writings on this subject, one cannot ascertain whether the author has in mind that lowering (raising) standards means knowingly accepting greater (less) risk than before or the imputation of less (greater) risk to given assets, or both. Only the first meaning is used here.

[2] Wallich, AER (Papers and Proceedings), XLIII (May, 1953), p. 40.

> be willing now to consider projects which they would have refused previously....They may lower their requirements with respect to the "current ratio" which is so frequently used as an index of the credit-worthiness of their customers, and resort to other devices for creating an outlet for their funds.[1]

It is sometimes argued that raising standards is equivalent to,[2] or a substitute for,[3] a rate increase. However, one can go beyond this and maintain that raising standards involves rate increases if the bank not only eliminates some applicants but moves others to higher-rate classes. For example, under stringency conditions fewer borrowers qualify for the prime rate. Thus, the average rate paid may rise without any change in the schedule of rates.

There is some evidence that the effect of raising standards may not be so drastic as might be thought. Commenting on stricter "rules of thumb" McKean states: "Actually, such rules usually force a customer to a different source or a different type of loan that requires higher interest rates or monthly payments."[4] However, "there are probably sharp discontinuities in the cost of obtaining additional funds. When money is tight, some sources dry up entirely, and the interest rate at which one can borrow another thousand dollars may be much higher than the rate on a smaller loan."[5]

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[1] F.A. Lutz, op. cit., p. 829.

[2] Milton Friedman, "Comments on Monetary Policy," Review of Economics and Statistics, XXXIII (August, 1951), p. 189.

[3] See last sentence of foregoing quotation from Wallich.

[4] Roland N. McKean, "Wartime Monetary Events and Monetary Theory," AER (Papers and Proceedings), XLII (May, 1957), p. 128.

[5] ibid., p. 129.

The rationale for, and effects of, a change in non-interest terms are similar to those applicable to a change in interest rates:

> Maturity, collateral, and purposes for which the funds are to be used....can all be adjusted to make the credit safer and more profitable for the banker and more burdensome for the borrower. Thus a small rise in the rate accompanied by stiffening of other conditions may be the equivalent, in terms of restraint produced, of a large increase in rates without such stiffening. Bankers are probably quicker to stiffen their non-interest terms than to increase rates, since the former are less obvious.[1]

To conclude, it is evident from this discussion that there is much interrelationship among the various responses to a shift in demand for loans. Credit rationing, as the term is used herein, is mainly an "impact" phenomenon. Gradually, the bank acts to achieve a new equilibrium, through rejecting certain applicants and reducing the amount allotted to others (thus cutting "demand" and reducing risk), through reclassifying some borrowers into higher-rate brackets (thus increasing average yield), through raising interest rates on certain classes of loans (increasing yield), through imposing stricter conditions on borrowers (reducing risk and increasing yield), and through allocating more funds to loans (increasing yield and risk).[2]

Most of these adjustments may be depicted on the Basic Diagram (Figure 4). The initial rise in loan demand carries line KL above P. inducing the bank to deny some funds to applicants. Demand for loans can be reduced by means of

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[1] Wallich, AER (Papers and Proceedings), XLIII (May, 1953), p. 39.

[2] cf. Smith, op. cit., pp. 595-596.

(1) raising standards, (2) raising rates, and (3) imposing additional requirements on the borrower. The effects of these actions also is to enhance the attractiveness of loans, through reduced risk and increased rates, so that the preference surface shifts, each point rising (in the utility-dimension) approximately in proportion to the L/A ratio represented there. Point P also moves away from the X axis denoting increased loan preference. Equilibrium is attained when P again lies on KL.

Nonprice Competitive Activities

Banks, in common with other firms operating in imperfect markets, have the option of employing nonprice competition as well as competition via price changes. The former type may take a variety of forms, including advertising, improving the attractiveness of facilities, direct solicitation of business, to name three important ones. As a general rule, we can say that nonprice competition will be engaged in if the balance-sheet composition and total assets expected as a result of using this form of competition are more attractive to the bank than the balance-sheet composition and total assets expected in the absence of nonprice competition; and that nonprice competition will be undertaken of such form and magnitude as will maximize the expected utility of the bank. It is assumed that the expectation that a course of action will enable the bank to achieve a higher level on its indifference surface will induce the bank to take that course of action. Also, to simplify treatment of the problem the statement neglects possible liability-mix effects and assumes that the interest rate structure and level

are unaffected by nonprice competition.[1]

Let us take the case of a bank which is debating whether or not to advertise for loans. The bank is currently at an equilibrium position, given limited loan demand, so that line KL of the Basic Diagram is below P. The effect of the advertising expenditures alone on the bank's balance sheet will be to reduce bank reserves and the reserves-to-assets ratio.[2] On the Basic Diagram this would appear as a movement of R upward to the right along a line drawn from the origin through old point R. This would denote the same earning-asset mix but a smaller reserves-to-assets ratio. Line KL shifts upward so that the same loan demand, in dollars, is depicted but now represents a larger percentage of assets.

This reduction in total assets, or decrease in size, will probably make the total satisfaction attributable to a given asset-mix less than before, as we shall see subsequently. But the amount involved will undoubtedly be such a small percent of total assets that this size-effect can be ignored in most cases. The drop in the reserves/assets ratio may either intensify or tend toward counterbalancing this loss; but even if it works in the latter direction the loss cannot be completely counterbalanced. To hold that it can would be to hold that the reserves lost possessed negative marginal utility for the bank.

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[1]It is recognized as a possibility that the bank might engage in nonprice competition and at the same time raise loan rates; but this is considered rather exceptional behavior and so will not be enlarged upon.

[2]The capital-to-assets ratio also will decline, probably reducing the total utility of the assets. See Chapter X.

Whether the new equilibrium asset-mix will include a higher or a lower reserves/assets ratio cannot be determined a priori. Any sale of earning assets would reduce the income-earning base, a condition undesirable in itself. On the other hand, there is the generally greater need for reserves relative to total assets on the part of smaller banks (see Chapter XI); but this too would exert an extremely slight influence. Another factor that might influence the bank toward desiring a higher reserves-to-assets ratio is the higher loans-to-assets ratio. It will be recalled that our Basic Diagram is drawn to embody that assumption, but evidence is not strong enough to justify reliance on it. Legal reserve requirements, an additional influence, will operate to increase the reserves/assets ratio since there has been no change in either the amount or the mix of deposits. A final factor, the lower capital/assets ratio resulting from the advertising expenditures might be expected to exert pressure toward a higher reserves/assets ratio, as will be brought out in a later section.

Thus, considering only the advertising expenditures, we find that it is reasonable to conclude that the new equilibrium position will probably contain a higher reserves/assets ratio, a higher loans/assets ratio, and hence a lower investments/assets ratio. We must, however, go on to consider also the effects on loan demand.

The initial results of advertising for loans, leaving aside advertising expenses now, will probably be increased bank loans and deposits, followed by decreased reserves and deposits. Referring to the Basic Diagram again, if we assume loss of re-

serves equal to the increase in loans, point R denoting the bank's actual asset-mix moves directly upward, along with line KL, away from the X axis. This will lead the bank to liquidate certain investments in order to achieve a more desirable balance among classes of assets, i.e., a higher level of utility. The effects of an increase in loan demand are thus seen to be an increase in the ratio of loans to assets, decrease in the ratio of investments to assets, increase in the reserves/assets ratio, and increase in total utility - provided, however, that the assumptions made in the second paragraph of this section and those underlying the Basic Diagram are substantially realistic. The above four conclusions may be altered in extent, but almost certainly not in direction, of effect when we consider that the bank's total assets will likely increase as a result of increased lending, inasmuch as borrowers are not likely to withdraw all of their deposits at once; in fact, as a group they are not likely ever to withdraw all of their deposits.

The effects of these two influences - that of the advertising expenditure itself and that of the resultant increase in loan demand - must now be combined. Line KL, the loan-demand line, will be expected to shift upward; and the bank's equilibrium asset-mix will probably change in the following ways. The loans/assets ratio will increase, since our original assumption was that point P was above KL. The reserves/assets ratio will probably increase because of the rise in L/A and, of less importance, a fall in the K/A ratio due to advertising expenditures and an increase in deposits. This leaves the investments/assets ratio no choice but to decline. The height of the preference surface is affected both

by the change in quantity of bank assets and by the change in the bank's capital/assets ratio. Presumably, the bank will expect the advertising campaign to pay off in increased loans and deposits that will more than counteract the effects of the advertising expense alone on reserves, total assets, and capital/assets ratio. Since increased size itself is generally sought, this will mean that any given asset-mix will be associated with greater utility than before, despite the pull of the lowered capital/assets ratio in the opposite direction.

Now the discussion has reached the point at which a generalization is appropriate: the bank will be induced to carry out a particular advertising campaign (assuming it to be the best alternative means of improving total position known to the bank) if the expected effect on total utility is favorable. The expected effect on total utility will be the combined effects of three influences - changes in asset-mix, change in quantity of assets and change in capital/assets ratio - on the preference structure. If the first and second, in the form of increased loans and size of bank, is expected to overbalance the third, lowered capital ratio, the bank will be induced to carry the program into effect.

Other forms of nonprice competition, and combinations thereof, can be similarly analyzed in terms of their expected effects on size, capital/assets ratio, asset-mix, loan demand, - all or any of these, as appropriate to the particular problem - and the resultant effects on the bank's utility position.

CHAPTER VII

RISK

Treatment of the whole problem of the risk aspect of a bank's asset structure requires consideration of five matters: (1) the actual risk involved in a given asset structure, (2) the bank's estimate of the risk, (3) the significance of this (estimated) situation to the bank (4) the bank's estimate of these consequences, and (5) the bank's attitude toward the situation, i.e., toward the risk and its significance, as assessed by it. Definitions of risk generally seem to cover (1) or (2) or both, while the other three are considered by implication to determine the preference structure. This is largely a matter of definitional convenience - one could argue quite plausibly, for example, that the "true" risk inherent in a situation really includes the ability of the subject to stand losses - nevertheless, it seems wise to conform to tradition in this respect. Accordingly, in the first section the determinants of risk will be discussed, and in the second section the determinants of the consequences of a given unfavorable outcome will be examined.

Determinants of Risk

Credit Risk of Individual Assets

There is little likelihood that the bank will be able to collect more than the amount due, so credit risk is largely a one-way proposition, with the maximum value of the debt at maturity quite definite but no certain minimum value short of

zero. Credit risk is generally understood to depend on the capacity and willingness of the borrower to meet his obligations promptly and in full when due. There are several facets to credit risk. The expected economic condition of the debtor is one, of course; but other relevant factors include the characteristics of the debt instrument itself, familiarity of the bank with the particular type of asset, the reputation of the debtor, and the length of time the arrangement is to run. These will be examined in order listed.

The expected economic condition of the debtor is a relevant consideration for all types of earning assets.[1] To aid the bank in making an adequate judgment of this factor is the reason for the assembling of financial and other data concerning the would-be borrower or the issuer of securities being considered for purchase by the bank. In this study it is not expedient to go into detail regarding the process of credit analysis. The obvious point is that the bank considers this a crucial factor in deciding whether, and how much, credit should be granted to the applicant and what rate of interest to charge him, in situations where the bank has some discretion in this regard. If the required information is lacking, there will probably be a tendency to impute a greater risk to the prospective earning asset than would be justified by the facts, had they been known.

It seems well substantiated that, in assessing credit risks, banks are influenced not only by "rules of thumb" as to

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[1]There are situations in which this applies also in the case of reserves. This is the case of the country whose government is about to collapse. Its rarity is reason enough to justify neglecting it here.

balance-sheet ratios and other objective financial data concerning a would-be borrower but by the prevailing "business climate" as well. In the 1920's, according to Young,

> Infected as some business and banking circles gradually became with the ideal of an attained economic equilibrium, with only minimum deviations from a progressive upward trend of industry and trade probable, it is possible that in their calculations many bank managements slowly came to discount the possibility of being confronted by an adverse mass psychology.[1]

In a recent study based on replies of bank supervisory agencies to questions regarding bank practices, a similar opinion was expressed by a respondent: "General optimism brought about by many years of successful lending has dulled the perception of some lending officers and led to a lack of caution and wariness."[2] In contrast, a careful study of credit availability in the early 1930's, conducted by the National Industrial Conference Board, showed that, of the 466 firms in their sample reporting credit refusal or restriction, 39 percent were not rated in the latest edition of the R.G. Dun Reference Book, and of the other 61 percent, 50 percent rated high, 30 percent good, and 20 percent fair or limited. The study concludes, in a statement so much hedged about with words of caution that a conclusion barely leaks through:

> A cautious inference would be that, if the consensus of trade opinion ranks so many of these concerns good or high, in at least a small portion of the cases thus ranked the credit refusal or restriction by the bank was not altogether justified from the standpoint of their

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[1] The Banking Situation in the United States, (New York: The National Industrial Conference Board, 1932), p. 93.

[2] Livingston, op. cit., p. 27.

general credit character.[1]

One important reason reported for these refusals was that banks had rather suddenly adopted higher standards in their lending, involving rejection of many requests for intermediate-term credit and a demand for complete or partial repayment of many such loans.[2]

Another study of credit availability during the early 'thirties, limited to the Seventh Federal Reserve District, reached essentially the same conclusion.

> The most striking difference between the present [1934] situation and that which prevailed for many years prior to the advent of the present depression is the disfavor into which...working capital loans, nominally short-time, but really long-run, have fallen. This disfavor is evident in the attitudes both of bank examiners and of bankers. The situation is made worse by the fact that some, though apparently not very many, bankers have the idea that in order to qualify as a good commercial loan, not only must the transaction be a self-liquidating one, but the liquidation must occur within some arbitrary time limit....This wave of righteousness among the banks and the bank examiners accounts for a very large proportion of the current discontent over the unavailability of bank credit.[3]

With reference to earning assets other than business loans, certain points involving the economic status of the borrower may be noted. In consumer and urban mortgage lending, this variable - economic status - is a function mainly of the borrower's resources and of the stability and size of his (its) income. Risk of default is about zero in the case of

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[1] The Availability of Bank Credit, (New York: The National Industrial Conference Board, 1932), pp. 97-98.

[2] ibid., pp. 128-129.

[3] Charles O. Hardy and Jacob Viner, Report on the Availability of Bank Credit in the Seventh Federal Reserve District (Washington: Government Printing Office, 1935), pp. 13-14.

Federal government securities, the main type of bank investment, and considered very low for most securities issued by states and their subdivisions and backed by the full faith and credit of the issuing political entity. But in purchasing non-government securities, banks are supposed to try to avoid credit risk; and there is state and Federal legislation designed to effect this result. To illustrate, member banks are forbidden by a regulation of the Comptroller of the Currency to invest in bonds which are speculative - which, in practice, means those rated as such by two or more of the three top rating services: Standard Statistics and Poor, Moody, and Fitch, Emphasis is placed by the Comptroller on safety and soundness of investments. Thus, the default risk of items in the investment portfolio is generally minimal.

A second aspect of risk of nonpayment has to do with the expected status of the security itself and applies equally to loans and investments. The legal status of the security need not be discussed here. This is not to deprecate the importance of observing all the requirements regarding negotiability, form of agreement, etc.,[1] but rather to recognize the fact that these matters are handled in rather routine fashion. Priority of claim, too, is hardly a matter of great practical concern to banks. With few exceptions banks may not hold stocks, nor are they likely to buy income bonds,

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[1]According to Livingston, "it is significant that several bank examiners pointed out weaknesses in the establishment of the legal aspects of a loan. A surprising number of losses resulted from the bank having no claim against the borrower because of inadequate legal provisions, overlooking necessary legal forms, or failure to consult with legal counsel in unusual loan cases." Livingston, op. cit., pp. 44-45.

revenue bonds, or other securities in which priority of claim to periodic payments, or to principal in case of default, is likely to be in question, since regulations limit their holdings to securities of minimal credit risk.

Third on the list of influences on the status of the security itself, i.e., the worth of the claim apart from the degree of optimism concerning the economic status of the borrower, is the presence or absence, and value, of some provisions in the contract giving additional protection to the creditor beyond the mere evidence of debt. This may take the form of collateral, a guarantee, public or private, of all or part of the amount of the obligation, or a stipulation giving the lender some control over the borrower's affairs.

The role of collateral as a risk-reducer is too obvious to require long comment. It may seem anomalous, however, that secured loans usually carry higher rates of interest than unsecured loans; but this is explained mainly by three factors: (1) most secured loans are made to small borrowers, a group which normally pays higher rates, (2) there are often costs involved in handling collateral, especially where warehousing or receivables financing is involved, and (3) in the case of larger companies, the fact that collateral is required usually reflects relatively weak financial position, hence greater credit risk. Despite the cost involved; "For business borrowers with assets of less than $50,000, loans secured by nearly all of the major types of collateral carried average interest rates significantly below average rates on unsecured loans."[1] This difference in rates apparently is due

[1] Tynan Smith, "Security Pledged on Member Bank Loans to Business," Federal Reserve Bulletin, June, 1947, p. 670.

to the reduction in risk which more than offsets the increased costs.

The provision of a loan guarantee has been a potent factor in the past two decades in inducing banks to make loans of types and amounts which they would not otherwise even have considered. For example, in a study of commercial bank and life insurance company practices in urban mortgage lending, Behrens found a marked liberalization in the average length of the loan contract and in the average loan-to-value ratios of the loans of both of these types of institutions.[1] The scope of Federal activities in this area is indicated by these examples: Federal Housing Administration insurance of real estate mortgage and other types of loans; the various wartime and reconversion guaranteeing programs of certain Federal procurement agencies; the RFC Blanket Participation Program (1945), by which a bank could arrange for a guarantee of 75 percent on loans to business by meeting specified conditions; and the so-called GI Bill of Rights provisions for guaranteeing loans to veterans for the financing of farm real estate, businesses, and residences.

The third type of protection - provision in the loan contract giving the lender some control over the borrower's affairs - is exemplified by the relations between banks and finance companies.

> It is not uncommon...for banks to take a detailed interest in the activities of their finance company clients. They can require not only the financial statement of the finance company, but also information on

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[1] C.F. Behrens, Commercial Bank Activities in Urban Mortgage Financing (New York: National Bureau of Economic Research, Inc., 1952), p. 8.

> their loans, e.g., distribution of their loans with special reference to the totals loaned to any of the finance company customers, and the industry represented by the particular loans.[1]

Another instance of lender control is the provisions which may be written into term-loan agreements, which "may control the borrower in such important matters as (1) maintenance of the proper current ratio or maintenance of the net current position at a fixed dollar amount, (2) limitation on borrowings, (3) limits on dividend payments and (4) acceleration of the maturity in the event the borrower fails to abide by the agreement."[2]

Familiarity with the particular type of financial asset is a factor that seems to play an important part in banks' assessment of the riskiness of a given asset. Being conservative, perhaps by nature and certainly by necessity, bankers appear to be skeptical of any "new" form of debt arrangement. However, a combination of observation, experience, rationalization, necessity, and - in some cases - change in legal status enable bankers gradually to acquire a more adequate conception of the risk involved in connection with the novel type of debt instrument and, acting on this information, to give it a place in their portfolios more nearly in line with its "true" risk. Cases in point are term loans and consumer installment loans. With respect to the former, experience and observation were facilitated by Federal Reserve and Reconstruction Finance

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[1] Alhadeff, Monopoly and Competition in Banking, p. 16.

[2] Herbert V. Prochnow, Term Loans and Theories of Bank Liquidity (New York: Prentice-Hall, Inc., 1949), pp. 417-418.

Corporation lending and participation with banks on a term basis, as a result of which "banks became more acutely aware of the fact that terms of loans could often be safely extended beyond the traditional limits if amounts of debts were systematically reduced in accordance with the income and expenditure pattern of the borrower."[1] Necessity came from the decline in importance of the traditional commercial loan, the increase in competition for desirable loans and investments by banks and other financial institutions, and the rise in bank deposits. Change in legal standing came in the form of the abandonment of the examination policy of automatically classing non-seasonal loans as "slow."[2] And the theoretical rationalization consisted of the so-called "anticipated income" theory of bank liquidity.[3]

In the case of consumer loans, observation of consumer finance company successes furnished an impetus which was abetted by experience in handling FHA Title I loans. Doubtful legal standing of such loans was removed by amendments to state banking statutes allowing higher than usury rates on such loans. The rise in deposits and reserves coupled with deficient traditional outlets again comprised the necessity. Rationalizations cited by bankers included the diversification provided by such loans and the fact that they enabled a more

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[1]Neil H. Jacoby and Raymond J. Saulnier, Term Lending to Business (New York: National Bureau of Economic Research, 1942), p. 25.

[2]ibid., pp. 21-26.

[3]Prochnow, op. cit.

complete banking service to be provided.[1]

The fourth major factor behind the credit risk imputed to an asset is the reputation of the debtor, both as to integrity and as to management ability. This is the "character" and "capacity" aspects of the oft-cited three C's of credit, the other, "capital," being implicit under expected economic conditions of the debtor and a possible fourth, "collateral," having just been discussed.

Length of time until the obligation matures is the fifth and final category. This factor is closely related to the above categories, coloring the confidence which can be placed in the bank's estimation of them.

Total Credit Risk of Asset-Mix

As is true for credit risk of single assets, so here: the nature of debt contracts sets a maximum value for a debt at maturity regardless of how "sound" the creditor and the instrument are, while the minimum expected value may be as low as zero.

It is not quite correct to view the risk of the whole amount of assets as merely the summation of the risks of each item. To be sure the risks of individual items influence portfolio risk, but there is an additional factor: the degree to which the credit risks of the earning assets are interdependent. This is the basis of the theory of diversification,

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[1] J.M. Chapman and Associates, Commercial Banks and Consumer Instalment Credit (New York: National Bureau of Economic Research, 1940), pp. 21-22; and D.C. Barry, "Consumer Financing and Its Relation to the Commercial Bank," Journal of the American Statistical Association, XXXIII (March, 1938), pp. 51-52.

namely, that if the portfolio can contain earning assets originating in several types of economic regions, a number of industries of different seasonal and cyclical patterns, catering to different classes of customers, etc., the total credit risk will be lessened. Thus, for example, the question of the advisability of making an additional farm mortgage loan, so far as risk is concerned, cannot be answered merely by reference to the risk inherent in the loan itself, but must also include consideration of what such an earning asset would do to the riskiness of the whole portfolio.

Money Risk

Money risk is commonly thought of as the risk of a decline in the price of an asset associated with a rise in relevant interest rates.[1] According to the terminology employed in this study, it is evident that the money risk of an asset has nothing directly to do with whether its price is is expected to rise or fall and, if so, by how much. That is strictly a matter of yield. What money risk describes is essentially the range within which the asset price is expected to fluctuate as a result of changes in interest rates. Thus if the asset is not expected to change in price over its entire length of life, there is still money risk involved so long as perfect certainty of market interest rates is lacking. On the other hand, if it is absolutely certain that the market rate of

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[1] Cf. the following definitions of money risk: "the possibility of a fall in the market value of outstanding issues because of a rise in the market rate of interest." Milton L. Stokes and Carl T. Arlt, op. cit., p. 282; "the possibility that before repayment there may be a rise in interest rates." Eugene S. Klise, Money and Banking (Cincinnati: South-Western Publishing Co., 1955), p. 312.

interest applicable to a particular class of assets will rise by n percent at time t and that no other change in the rate will occur over the life of the asset, we must maintain, for the sake of consistency, that no money risk is involved. This distinction is not observed in the usual formulation of the money-risk concept.

We follow custom in limiting this discussion of the money-risk element to investments.[1] There is no need to distinguish between single-asset and portfolio risk in this case because risks of price fluctuation are not, to any degree, interdependent. Any variable-price asset will have the same money risk in any portfolio makeup.

There are several determinants of the likely range of price changes that may occasion no "surprise" to the holder of a particular asset. These may be organized under the headings of (1) forces operating in the money and capital markets affecting interest rates, (2) nearness of the asset to maturity, (3) shiftability of the asset, and (4) the speed with which interest rates are expected to change.

First, all of the myriad economic, psychological, and governmental factors which act upon interest rates and asset prices are obviously of crucial importance in influencing the

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[1] Classes of loans, too, may or may not be shiftable, depending on whether or not secondary markets for them exist and whether or not the loans are rediscountable. For example, a central guarantee fund might be expected to have as one of its results "some uniform pattern for loan contracts, so that loans, even to obscure borrowers, would be more marketable and less illiquid." E.S. Shaw, op. cit., p. 204. (See references cited in footnote 1 on that page). An actual instance of such a development, of course, is the secondary market for urban mortgages, which has achieved quite a respectable development in recent years.

bank's estimation of the range of price changes likely, both as regards specific earning assets and as regards the total of earning assets. It is not possible, within the scope of this study, to elaborate on this topic; but a few words regarding one of the key influences - Federal Reserve policy - may be in order because it is at this point that the doctrine of credit availability is involved.

Probably the most detailed analysis of this doctrine is contained in Chapter I of Scott's dissertation, referred to in Chapter VI of the present work. Excerpts from his summary are quoted to bring out the key points of the availability argument.

> (1) The availability doctrine implies the existence of substantial holdings of the same kinds of assets by the central bank and by financial institutions who lend to private borrowers. The ability or willingness of the central bank to buy and sell these assets must be great enough to enable it to have a marked effect upon their prices in the open market.
>
> (2) Changes in the terms according to which the central bank buys and sells assets must affect the liquidity or riskiness of the lender's portfolio sufficiently to cause a significant change in the willingness of the lender to buy and sell assets. With respect to interest rates, it is both a necessary and a sufficient condition that yields on the kind of assets held by both the central bank and the financial institutions be allowed to vary....
>
> (3) The immediate effect of central bank action is to increase the riskiness and illiquidity of the investor's portfolio. This leads to an increase in the demand for relatively riskless or liquid assets, namely government securities....
>
> (4) The relative increase in the demand for government securities implies a relative decrease in the demand for the more risky private securities.[1]

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[1] Scott, op. cit., pp. 36-40. The reader is referred to the entire chapter for an abundance of citations and quotations from the literature on availability.

Although contingency balances are not referred to directly by Scott, it is generally agreed that increasing uncertainty will tend to stimulate demand for reserve balances as well as for more liquid, less risky, earning assets.[1]

It is not easy to find convincing evidence for or against this doctrine. Data are often subject to various interpretations, and a multiplicity of forces are constantly at work shaping the economic magnitudes involved. Some studies have been made, however, which bear on this topic. These are referred to briefly at this point.

In November, 1955, the results of a survey by the American Bankers Association concerning bank reactions to Federal Reserve monetary actions were published.[2] The findings are based on replies received from 1,000 banks, with two-thirds of total commercial bank assets. Answers to a question concerning changes in lending policy of the bank are summarized in Tables 2 and 3 below.

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[1] J.M. Keynes, The General Theory of Employment, Interest, and Money (New York: Harcourt, Brace, 1936), p. 196; Fellner, Monetary Policies and Full Employment, pp. 148-156; Homer Jones, "The Optimum Rate of Investment, the Savings Institutions, and the Banks" AER (Papers and Proceedings), XXXVIII (May, 1948), p. 333.

[2] E. Sherman Adams, "Monetary Policy and the Present Credit Situation," Banking, XLVIII (November, 1955), pp. 36-41, 155.

Table 2

Changes in Bank Lending Policy since 1954,
by Size of Bank
(Percent of Column Totals)

Lending policy since 1954	Size of bank ($000,000 of assets)				
	All banks	Under 10	10-50	50-500	Over 500
Total	100	100	100	100	100
Somewhat more liberal	9	10	8	12	0
Unchanged	24	28	25	18	28
Somewhat less liberal	67	62	67	70	72

Source: ibid., p. 37. All figures except those in the "all banks" column were read from a bar chart.

Table 3

Effect of Shift in Monetary Policy Since 1954
on Increased Selectivity in Making Loans, by Size of Bank

(Percentages of Column Totals)

Effect on increased selectivity	Size of bank ($000,000 of assets)				
	All banks	Under 10	10-50	50-500	Over 500
Total	100	100	100	100	100
No effect	46	49	44	37	16
Hard to say	13	17	12	12	11
Some effect	41	34	44	51	73

Source: ibid., p. 38.

Several comments concerning these data are reproduced:

> In interpreting these results, it should be remembered that many bankers, especially in smaller institutions, do not think in terms of making their lending policies more strict or more liberal from year to year.... /The banker/ knows from long experience that, when he analyzes the loan application, the key considerations should be the purpose of the loan and ability to repay. His appraisal of ability to repay may be influenced at times by changes in economic conditions but he does not always think of this as being a change in his lending policy.
>
> In larger banks where lending authority is widely dispersed, there is need for more precise policy definition. This is probably one reason why larger banks report more change in their lending policies

than smaller banks....
In almost all...cases [of greater liberality], relaxation has occurred only with respect to automobile loans.[1]

Conclusions reached are summarized below:

> The results of this survey indicate that the chief reason for increased selectivity in banking this year [1955] has been the development of boom conditions and the shift in the monetary policy of the Federal Reserve System....It is clear that Federal Reserve policy has helped to restrict the growth in total bank deposits. As a reault, the increasing demand for loans has resulted in a rising ratio of loans to deposits. The survey shows that this has been one of the strongest factors tending to induce greater conservatism in bank lending.[2]

These statements do not seem to jibe with the fact of the growth in loans during this period:

> The expansion of bank loans in the period from January to September 1955 is the most rapid on record. In view of this fact, it is rather difficult to believe that the policy of credit restraint which prevailed during this period had very much effect on the expansion. It appears that commercial banks reacted to the increase in demand for credit and the accompanying contraction in the supply of reserves by selling a large volume of short-term securities.[3]

In explaining this discrepancy between (1) the behavior seemingly to be expected according to the availability doctrine, (2) the feeling of bankers that they <u>were</u> being more restrictive, and (3) the fact that loans expanded enormously in the face of a restrictive monetary policy, at least two reasons may be advanced. First, it seems that the significance of <u>ceteris paribus</u> was not fully appreciated by at least some of the proponents of the doctrine of availability - or, at any rate, was not made explicit. Thus, although the stringent

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[1] <u>ibid.</u>, p. 38.

[2] <u>ibid.</u>, p. 39.

[3] W.L. Smith, <u>op. cit.</u>, p. 598.

policy of the Federal Reserve apparently made bankers more reluctant to lend than they otherwise would have been, so powerful were the forces working in the opposite direction - strong demand for loans and a feeling of buoyancy in the economy which caused bankers to view more applicants as creditworthy - that loans increased anyway. In a very real sense, many versions of the availability doctrine overstressed the supply side, while the events of 1955 called attention dramatically to the importance of demand factors.

The second reason relates to the strength of the "customer relationship" in banking. This matter will be referred to later in the chapter, but it seems appropriate to mention here, too, that the bank is typically reluctant to turn down good customers of long standing. This long "time horizon" is not unique to the bank, of course, but it helps explain why banks were willing to take substantial capital losses in shifting from investments and (secondary) reserves into loans.

The second determinant of rate-fluctuation, or money risk, narrowing the discussion now to individual earning assets, is the length of time the particular asset has until maturity. The nearer to maturity is an earning asset, the less widely, cet. par., its price will be expected to fluctuate. The accompanying table illustrates this principle, bringing out clearly the effects of two influences - the amount of change in market rates and the distance from maturity - on the appreciation or depreciation of an interest-bearing debt instrument.

Table 4

Changes in Price of a 3.5 Percent Bond with Different Maturities at Various Market Rates

Market Rate, Percent	Years to Maturity			
	1	5	10	20
4.5	99.03	95.57	92.02	86.90
4.0	99.52	97.65	95.91	93.16
3.5	100.00	100.00	100.00	100.00
3.0	100.49	102.31	104.29	107.48
2.5	100.98	104.68	108.80	115.66

Source: Steiner and Shapiro, op. cit., p. 204.

Shiftability, the third factor, a concept that has attained respectability within the past few decades,[1] defines the quality of an earning asset of having access to a wide and ready market, so that if the present holder wishes to liquidate, there are potential buyers ready to take the asset at a price which is fairly closely predictable in advance. Of course, shiftability is not an inherent quality of an earning asset but rather is determined by money-market institution, government policy, economic conditions, and even the stage of economic development.

The influence of the first two items in the above list

[1] Although Moulton wrote in 1918: "An individual bank does not place reliance to any great extent upon maturing obligations, liquidity is a matter of shifting assets to other banks in exchange for reserve funds." Harold G. Moulton, "Commercial Banks and Capital Formation, III," JPE, XXVI (August, 1918), p. 730. Cf. also Rodkey, op. cit., p. 12: "As a matter of fact, among bankers it never has been common to make any distinction between liquidity and shiftability."

hardly requires discussion, but the third and fourth might profitably be commented upon. An example of the influence of economic conditions is found in the experience of banks in the 1920's and 1930's with regard to bonds as investments. During the earlier period, marketable bonds in general were regarded as secondary reserves, regardless of their maturity; while in the 1930's, having been severely hurt by declining prices on many of their bonds, the banks and financial writers began to stress shortness of maturity as a requirement for the secondary reserve category.[1] An illustration of the effect of the stage of economic development is contained in the following quotation, part of a discussion of banking conditions during the period of development of the agricultural Middle West:

> The rapid rate of growth of the country created a very active market for capital goods, so that during a period of expansion such assets were regarded as liquid. Similarly, loans against capital assets had a ready market. Therefore a bank, under those conditions, could safely lend money for capital purposes because it was not considered necessary to hold a note until it was paid. Recourse could always be had to the market, in which many buyers were ready to assume such notes. As soon as the rate of expansion began to slow down, however, the speculative demand for capital assets subsided, thus reducing the liquidity of capital loans.[2]

Eligibility of an earning asset for rediscount by the Federal Reserve, a property of an asset closely akin to shiftability, would be expected to enhance the attractiveness of an

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[1] Some writers are stressing two types of non-primary reserves: one class for more or less expected liquidity needs for seasonal and random fluctuations and a second class for rather remote liquidity needs. Short maturities are considered requisite for the first, while quality is stressed for the second type. See Rodkey, op. cit., Chs. 3-4; Robinson, Management of Bank Funds, Chs. 4-5; and Klise, op. cit., pp. 320-323.

[2] L.R. Lundeen, "Problems of the Local Loan Account," in Stevenson, op. cit., p. 118.

earning asset possessing this status. Riefler lists this as one reason why ordinary customer loans usually carried (as of 1930) lower interest rates than loans secured by stocks and bonds.[1] Ernest Shaw, however, writing at the same time, takes a different view of the effect of the rediscount privilege. Basing his conclusions on interviews with bank officers, he states:

> In actual banking practice...the amount of eligible paper which the bank had available did not seem to have an influence on the investment /i.e., portfolio/ policy in restricting or increasing the percentage of local loans carried...In fact, many of the officials of /the banks visited/ had little exact knowledge of the percent of their notes which would be eligible for rediscount.[2]

It would be difficult to reconcile these two views, each having evidence to support it, and the present author has no intention of trying to do so. Quite possibly Riefler had in mind larger banks and Shaw, smaller ones. At any rate, since banks may use their United States government security holdings as a basis for borrowing from the "Fed," and since this agency would undoubtedly use its very broad lending powers in cases of widespread financial distress, the rediscount privilege of so-called "eligible paper" is not of great significance at present.[3]

The final item on this list of influences on the range of expected price changes is the speed with which market rates of interest are expected to change. Here, again, an illustra-

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[1]Riefler, op. cit., pp. 88-89.

[2]Ernest R. Shaw, op. cit., pp. 66-67.

[3]Walter A. Morton, "Liquidity and Solvency," AER, XXIX (June, 1939), pp. 273-285.

tion should make the point clear. The following table brings out the effects of both speed and amount of change of interest rates on the value of an interest-bearing debt instrument. Of course, in the case of a fall in rates, the effects of these two variables would simply be the reverse of those indicated in the table.

Table 5

Percent Depreciation on 10-Year 2% Bonds, Should Interest Rates Advance from 2% to Various Other Rates

Interest Rate Change	In 5 years	4 Years	3 Years	2 Years
To 3%	4.61%	5.45%	6.27%	7.07%
3¼%	5.73%	6.76%	7.73%	8.74%
3½%	6.83%	8.05%	9.24%	10.39%
3¾%	7.91%	9.32%	10.69%	12.00%
4%	8.98%	10.58%	12.11%	13.58%

Source: Rodkey, op. cit., p. 62.

Determinants of Consequences of Change in Asset Values

The problem to be discussed in this section might be phrased in this way: given the asset structure and the ex ante size of the bank, what will a given change in the valuation of the bank's earning assets (deposits constant) mean to the bank? Emphasis will be on the consequences of a fall in asset values, since the consequences of a rise are not symmetrical to those of a fall. A rise can generally mean only higher profits, at best, and accompanying benefits; while a fall can, under certain circumstances, result in loss of control by the present dominant

faction or even complete destruction of the enterprise. That there must be many determinants of the consequences of such a decline should be evident. The following paragraphs attempt to call attention to the more important ones.

There is need to consider both loans and investments in this connection. Both types of earning assets are affected by the four general considerations which fall under this heading: namely, (1) need to record and/or publicize a decline in asset values (i.e., one not matched by a decline in liabilities) as determined by the market or by bank regulations and examiners; (2) possible business reactions to actual loss, regardless of publication, (3) need to realize such a loss, i.e., through sale or through write-off of all or part of its value, and (4) seriousness to the bank of a given realization of loss.

Need to record and/or publicize loss of asset value

If the bank were permitted to ignore (for the record) declines in the market value of its variable-price assets and declines in estimated value of loan assets, there would be less risk connected with holding earning assets. This is not to say that the bank should be, or is, indifferent to declines in such values but rather that to require valuation of variable-price assets, including money bonds, to follow all the vagaries of the market even though the bank may have only the remotest likelihood of being forced to liquidate before maturity is to interpose an <u>extra</u> risk - one not inherent in the economics of the situation.

The other aspect of loss-recognition is its public acknowledgement. The bank may fear that publication of the

fact that its capital position has deteriorated will set off a chain reaction of withdrawals, placing it in a shaky position with respect to its reserves. Thus, to the solvency-risk of being forced to record asset losses is added the liquidity-risk which may result from publicizing them.

Recognizing these dangers, albeit tardily, bank regulatory agencies during the 1930's altered their asset evaluation policies considerably. In the case of investments, a ruling of the Comptroller of the Currency in 1938 stipulated that banks may carry all of their securities of Group I quality at cost less amortization of premium (if any), completely ignoring any decline in market value, for appraisal and publication purposes. Since Group I securities comprise all marketable securities in which the investment characteristics are "not distinctly or predominantly speculative" - the same criterion required of member banks in purchasing securities - most or all bank security holdings of member banks, at least, are not subject to this risk.

In the case of loans, federal examiners now place in class one loans whose repayment appears certain, regardless of the maturity of such loans. This may be expected to forestall any wholesale liquidation of loans which banks and/or their examiners frown on solely or mainly on grounds of their non-seasonal nature. Liberalized policies on loan evaluation have been effective. As mentioned above, one of the factors leading to increased term lending by banks was the change in bank examiners' policy of automatically considering non-seasonal loans as "slow."

Despite more lenient regulations concerning loan

evaluation by examiners, the bogey of the bank examiner still exists as an influence over bank lending policies. The following excerpt from the Patman Committee report, part of a summary of written replies by the presidents of the Federal Reserve Banks to questions posed by the committee, illustrates this point:

> A review of banker attitudes following bank examinations, particularly as they relate to the effects of bank examiners on lending policies, indicates that officers in medium- and small-sized banks are probably influenced more by examiners' appraisal and criticism than are the officers of the larger banks. The lending officers in the larger banks generally are more thoroughly schooled in the analysis of credits, and have more complete credit information in their records.[1]

In his reply, the Comptroller of the Currency was inclined to deprecate the influence of bank examiners on lending:

> Particularly in smaller cities and towns, some bankers are reluctant to incur the danger of community ill-will which may follow from rejection of a loan application and the resulting antagonisms of the would-be borrower. This antagonism can be avoided, in some cases, by telling the applicant that the rejection is not due to any lack of confidence in his financial or moral responsibility, but is due to the instructions or unduly repressive attitude of the bank examiners.[2]

While not denying the possibility that this factor is part of the picture, it must be admitted that the evidence is strong to the effect that fear of reactions of bank examiners is genuine and not merely a convenient excuse for rejecting undesirable loan applicants.[3]

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[1] United States Congress, Joint Committee on the Economic Report, op. cit., II, p. 826.

[2] ibid., p. 937.

[3] See, for example, Miles L. Colean, The Impact of Government on Real Estate Finance in the United States (New York: National Bureau of Economic Research, Inc., 1950) pp. 72-73, and Jacoby, op. cit., pp. 256-257.

Reaction of the Business Community

Even if banks were not required to publicize their paper losses, there would still be the fact that their big customers and depositors are able to ascertain the situation through general knowledge of the financial picture. Fear of the resultant reaction, according to Brickner, has caused the banks to be wary of any variable-price securities, including government securities, and "to sacrifice current income in favor of protection against possible future reductions in market values."[1]

Probability of Need to Realize Loss

That the seriousness of a given price decline depends very closely upon the degree of likelihood of need to sell assets and so realize loss should be most obvious. Need to sell assets depends primarily upon stability of deposits, availability of funds for borrowing, the distribution of maturities of earning assets, and the pressure on the bank to grant loans.

Stability of Deposits.--The first of these determinants, stability of deposits, is dependent upon several factors: (1) the distribution of deposits among demand, time, interbank, and government; (2) the geographical dispersion of depositors; (3) the type of community served - whether boom-bust, agricultural, one-industry, etc.; (4) the character of the bank's clientele;

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[1]Arthur Brickner, Liquidity in Commercial Banking (Ann Arbor: University Microfilms, 1951), pp. 316, 318.

(5) the size of the average deposit relative to total deposits; (6) the liquidity of assets; (7) the economic outlook; and (8) the probable occurrence, type, and magnitude of monetary operations of the Federal government.

The importance of the deposit-mix stems from the fact that, under all but the most abnormal conditions, demand deposits are more volatile than time deposits, and interbank and government deposits are more volatile than demand. This is the reason given for the imposition of higher reserve requirements for demand deposits and also for central reserve city and reserve city banks than for country banks, the former classes of banks being typically holders of interbank deposits.

Diversification of deposits by geographical location is enjoyed mainly by regional branch systems and some very large unit banks. Inasmuch as depressed conditions can be highly local in character, wide dispersion of deposits can be a definite contribution to deposit stability. Similarly, the extent of diversification of economic activities of the community is a consideration, along with other economic attributes of the community: population, seasonality of activities, cycle-sensitivity, growth (or decline) rate, and others.

Clientele and size of average deposit relative to total deposits are obvious but important determinants of bank deposit stability.

Two factors external to the local scene also bear on likelihood of deposit stability: the economic outlook (as translated into the local setting) and monetary operations of the Federal government. Especially in the case of large banks

in money-market centers, open-market operations by the Federal Reserve may affect deposits and reserves quite suddenly and drastically. Expectations by the banks of pressure on reserves from this source will, cet. par., bring about a decreased willingness to commit funds to earning assets - particularly of the less liquid varieties - and an increased urge to hold balances for contingency reasons.

The liquidity of bank assets seems to be a factor in deposit stability, at least in times of financial crisis. In his case study of Chicago state banks covering the 1929-1933 period, F.W. Mueller observes that "deposits tend to move during periods of financial stress to those banks maintaining higher reserve ratios than the banks from which the deposits have migrated."[1] Whittlesey mentions, as one factor explaining differences in liquidity among banks, the fear by banks having big depositors that they might shift funds to other banks unless they (the banks) become and remain at least as liquid as their immediate competitors.[2]

Availability of Funds for Borrowing.--A second major determinant of the bank's estimate of likelihood of its being forced to realize a loss in asset value is the availability to the bank of correspondent, central-bank, and other sources of credit. This availability is largely dependent upon three factors: monetary policy, the bank's relation with the Federal Reserve and correspondent banks, and the distance of the bank

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[1]Mueller, "The Management of the Earning-Asset Portfolios of Forty-One Chicago State Banks, 1929-1933" (Unpublished Ph.D. dissertation, Northwestern University, 1942), p.387.

[2]Whittlesey, Bank Liquidity and the War, p. 5.

from the money markets. These three factors will be briefly examined.

If there is generated by the Federal Reserve the sentiment in the financial community that the Fed is about to act to tighten money, the result might be a change in opinion held by banks with respect to the likelihood that they will have to sell assets at a loss. In other words, yield expectations decline and, in all probability, the range of probable values increases.

Within the overall monetary climate, however, the position of the individual bank is affected by its relations with correspondents and with the Federal Reserve and by its nearness to money centers. The former relates to the ease, the latter to both speed and ease, of acquiring additional reserves.

Distribution of Earning-Asset maturities.--The third factor influencing the chances that a "book" capital loss will have to be realized is the spacing of maturities in the investment and loan portfolios. If the bank were successful in maintaining a conversion of matured earning assets into cash which coincided with its need for reserves, it would have achieved the ultimate. Such a policy would involve foregoing the chance for additional income from buying and selling to take advantage of market fluctuations, a practice resembling inventory speculation. Writers on bank policy generally recommend against this sort of speculation for any but the largest banks.[1]

Pressure to Lend.--The fourth and final factor is of a

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[1] e.g., Robinson, Management of Bank Funds, p. 397.

different order and is predominantly local in character: pressure on the banks to lend. Of course, the existence of a brisk demand for loan accommodation does not literally force the bank to sell assets, but the alternative of turning down applications and perhaps losing actual and potential long-term contacts may be even less palatable. Thus, in a practical sense, the bank feels a powerful inducement to sell investments. In fact, it is not at all unlikely that the bank will find itself torn between the alternatives of selling investments in a falling market in order to make more loans or foregoing desirable lending opportunities on grounds of shortage of excess reserves. The following quotations from recent sources bring this out:

> Last year [1955] bond prices weakened in the last half, as demand for money picked up. This meant that banks had to sell governments, most of which had been bought when bond prices were considerably higher, and take losses on the sales in order to supply their customers.[1]

> With loan demand strong [during the first four months of 1956], member banks found it necessary...to sell securities.[2]

The language used in these quotations evidences the feeling of obligation on the part of banks to satisfy customer credit demands.

Expected Consequences of a Given Loss

Three factors influence the anticipated results of a given decline in net assets occasioned by realization of a loss

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[1] "A Big Year for Loans, Mergers," Business Week, January 21, 1956, p. 74. Underlining added.

[2] "Bank Credit and Money," Federal Reserve Bulletin, June, 1956, p. 686. Underlining added.

in value of certain assets: the capital/assets ratio, the level of expected earnings of the bank, and its capital structure.

It is obvious that the larger is the bank's capital-to-assets ratio,[1] other things the same, the larger the loss it can absorb without insolvency and/or loss of control by the present holders of power, through merger or perhaps through the successful efforts of an insurgent group of stockholders to gain control of the board. Also, it was noted in the introductory chapter that the bank's asset structure, characterized by a high degree of liquidity as compared with that of business firms, is strongly affected by its narrow capital/assets ratio. But is it equally true that, comparing banks having low capital ratios with those having high ratios, or comparing the same banks at a time when they have low ratios with those same banks at a time when their ratios of capital to assets are high, one would find their portfolios to be more conservative in the first of each of the two pairs than in the second?

First, would we expect such relationships? On a priori grounds, the answer would seem to be a definite affirmative: a reduction in the capital ratio logically should lower the bank's risk-preference since it is in a more precarious position than before.

Then, what is the evidence concerning the effect of capital ratios on bank portfolio policies? Here, of course,

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[1]This ratio, rather than the capital/deposits ratio, was used because it measures capital protection more directly, although in practice it makes little difference.

we face the difficulty that other things are never constant. However, students of banking are almost unanimous in supporting the thesis that the capital-to-assets (or deposits) ratio is a determinant of the "riskiness" of the assets selected for bank portfolios, as a few instances will show. As applied to investments, a low capital/assets ratio often means a shying away from longer maturities on the part of such banks. One reason for this behavior, according to Robinson, is that many banks still use portfolio market value in judging solvency. Thus, in their investment policy they consider the amount of paper loss rather than realized loss which they can stand and still remain solvent in an accounting sense.[1]

The same author found that the usual response of banks which grew most rapidly during World War II, hence found themselves with the thinnest capital/assets ratios, was to modify their policies in the direction of greater conservatism.[2] Ryan found a relationship between the high capital/assets ratios of small banks and high loans/assets ratios, and he quotes from the FDIC to the effect that "the smaller banks do rely to a greater degree on loans and discounts than the larger banks, and a considerably larger percentage of such loans fall into the substandard classification."[3]

A few studies and arguments appear to cast doubt on the validity of this position, however. In an attempt to

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[1] Robinson, Management of Bank Funds, p. 350.

[2] ibid., p. 397.

[3] John Ryan, "Bank Capital and Size and Location of Banks," Journal of Business of the University of Chicago, October, 1952, p. 233.

discover whether there was any relationship between portfolio policies and relative growth in deposits (hence, presumably, decline in capital ratios) between 1939 and 1943, Whittlesey compared the portfolios of banks in the ten reserve cities which had experienced the greatest deposit growth with those in the ten reserve cities with the least growth. He concluded:

> In general the portfolio policies of the two groups appear to be very similar, and such differences as do exist are mixed in character. While the proportion of total Treasury obligations to total assets is almost identical in the two cases, on the average the group of banks with the greatest relative increase in deposits held a larger proportion of these securities in maturities of one year or less. This would seem to imply some correspondence between deposit expansion and liquidity of assets. On the other hand, this pattern of behavior is by no means uniform.[1]

Whittlesey also constructed two scatter diagrams to compare insured banks by states as to (1) relation between percentage increase in deposits and ratio of cash plus all government obligations to total assets and (2) relation between percentage increase in deposits and ratio of cash plus Treasury bills to total assets. For both diagrams, the date was June, 1943, and the period was June, 1939, to June, 1943.

With respect to the first of these comparisons: "The proportion of assets in the form of cash and Treasury obligations was closely concentrated between 70 and 80 percent of total assets. Such deviation as occurred was not appreciably related to differences in deposit growth."[2] With respect to the second comparison, there is again a concentration, this time in a range of 40-50 percent of assets; but the author

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[1] Whittlesey, Bank Liquidity and the War, p. 25.

[2] ibid.

finds little if any significant correlation between liquidity, as thus measured, and growth of deposits.

He did find that the ten states with the lowest relative percentage increase in deposits had a considerably lower reserves/assets ratio, but:

> Included in the group with the smallest relative increase in deposits are several Eastern states having many metropolitan banks whose excess reserves have fallen to a minimum. In the other group [i.e., the ten states with the fastest rate of deposit growth] are a number of agricultural states, including a high proportion of commercial banks which have tended to retain a considerable amount of excess reserves. Whether differences in the proportion of cash holdings in the various states reflect differences in deposit growth or in the types of banks that predominate is not at all clear.[1]

In fine: "the evidence fails to support the view that differences in relative deposit growth among groups of banks have exerted a major influence upon their portfolio policies."[2]

Several comments might be made concerning Whittlesey's procedures and results. In the first place, the period under consideration was, to put it mildly, very unusual, so generalizations are risky. Apparently Whittlesey realized this, because he uses the past tenses quite consistently and nowhere appears to generalize from this particular experience. Secondly, it may not be correct to state that, because banks generally or groups of banks have similar balance-sheet structures, they therefore have similar portfolio policies. Applied to this particular situation, it may well have been that the demand for loan accommodation from the fast-growing banks more than kept pace with their deposit growth; but, fearing for their deposits

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[1] ibid., p. 27.

[2] ibid.

in the future, these banks may have felt that to loan more would be to incur excessive risk, i.e., they estimated marginal loan risk to themselves as high. The other group of banks might have been more than willing to make more loans, but, in their view, there was no opportunity. In terms of the Basic Diagram, the former case may be described as loan-demand line KL being above point P, the second as P above KL, such that R in the second case would be located in almost the same position as P in the first. This is not to imply that this was the case in the period involved but simply to make the point that different portfolio policies may, because of different external conditions, lead to quite similar asset-mixes; or, in other words, similar asset structures do not constitute conclusive evidence of similar portfolio policies.

A third point: it would have been more desirable had the growth of deposits been compared with change in "liquidity" rather than with "liquidity" as of a given point in time. Whittlesey's procedure can hardly be said to measure the response of banks to this change in their situation since we have no inkling of their asset structures at the beginning of the period, i.e., June, 1939.

Finally, as deposits increase, not only is the capital ratio falling but bank assets are obviously rising; and size of bank is itself an influence on bank portfolio policy, albeit a minor one within a considerable range.

Considering these weaknesses and limitations, we must conclude that the findings of the study under discussion are of little use in supporting any generalizations regarding the influence of deposit growth and, presumably, capital ratio

decline on bank asset behavior.

Robinson, quoted earlier in support of the idea that the capital/assets ratio influences riskiness, notes in another connection that friction in the form of "tradition" may in some cases retard the working-out of this factor.

> The only way in which additional capital can contribute materially to increased earnings would be by influencing the lending or investing policy.../but/ many banks are so settled in their general asset management policies that changes of the sort outlined here cannot come quickly, in fact, they may never appear.[1]

One finds it difficult to reconcile these statements with the discussions by the same author in his Management of Bank Funds to the effect that bank loan and investment policies do change, in fact have changed drastically. Perhaps Robinson is here thinking in terms of small relative changes in capital or primarily of a certain class of banks. The latter possibility is supported by his use of the term "many banks" in the above quotation.

The direction of causation in the relationship between capital ratio and asset-mix may not be so simple as we have treated it here, viz., capital ratio as the independent variable. There is evidence that, at least under certain circumstances and within limits, the asset-mix is regarded as more or less autonomous and as determining the desired capital-to-assets ratio. This hypothesis was suggested above in connection with the bank's response to increased customer loan demand in the form of selling governments even when losses thereby had to be realized. An example of this "reversed" relationship between asset-mix and

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[1]Robinson, "Bank Capital and Dividend Policies," Harvard Business Review, XXVI (August, 1948), pp. 400-401.

capital ratio is contained in the following quotation from a news item. After noting that the old 1:10 rule for capital ratio had gone into disrepute during the last war as banks had acquired quantities of "riskless" assets, the article continues as follows:

> Lately...the skyrocketing of loans to business has tended to restore the old relationship of deposits and investments involving some risk. As a result, bankers are anxious to get back on the basis of the old capital-deposits ratio. Not since the 1920's has the trade been so busy arranging new stock sales as in recent months.
>
> There is no compulsion on the banks to do this.... As their loan portfolios thicken, many banks seem to think the old 1-to-ten capital ratio would be more comfortable.
>
> The feeling isn't limited to big city banks....Both large and small institutions have been selling new stock recently.[1]

Probably closer to the truth is the idea that the two magnitudes - desired capital ratio and desired asset-mix - are interdependent, a point which will be returned to in Chapter X. Another recent news item brings out the nature of this mutual determination.

> Traditionally, bankers regard loans as "risk assets;" cash and governments, being most liquid, are relatively "riskless." With 60% or so of their assets already in the risk category, many bankers are shying away from further loan expansion until they can enlarge their lending base.
>
> This feeling was undoubtedly one reason behind last week's announcement by Chase Manhattan bank...that it plans to sell 1-million shares of capital stock.[2]

There are perhaps two other determinants of the seriousness of the consequences of a loss realization, both of them of much less importance than the capital-to-assets

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[1] "Banks Hunt More Capital," Business Week, April 12, 1951, p. 124.

[2] "Moving Still Deeper into Loans," Business Week, October 13, 1956, p. 158.

ratio: (1) the level of expected earnings and (2) the make-up of the capital accounts. Neither requires extended discussion.

The first factor highlights the distinction emphasized in this study between inherent risk of assets and total risk involved in a given asset-mix. If net current operating earnings are expected to hold up, or increase, there is no doubt that the bank will regard a prospective loss on loans or through sale of securities with less fear than if the earnings outlook is unfavorable. The present (1956) situation may be cited as a case in point: it is highly probable that banks' willingness to sell securities on a falling market in order to make loans has been conditioned by high net earnings.

Distribution of total capital among the several capital accounts also may influence the seriousness of a given realized loss. In this connection, Prather notes the general replacement of the "double liability" provision with the requirement that banks build up their surplus account to an amount equal to capital stock, commenting:

> In effect, the proprietors are forced to make provision out of earnings for double protection of depositors. As a result, there is a tendency to regard the surplus item in the bank's statement as a permanent part of the capital structure. This has had considerable influence on the management of the undivided profits account, which is now handled in much the same way as the surplus item has been handled in the past....When earnings are placed in the undivided profits account, management has much greater freedom of action than when they are placed in the surplus account.[1]

Rodkey differs somewhat with this estimation of the undivided profits account:

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[1]C.L. Prather, Money and Banking, (4th ed.; Chicago: R.D. Irwin, Inc., 1949), pp. 264-265.

> [It] is doubtful that a bank would be able to charge substantial losses against its surplus account. Even the undivided profits account, which is more closely akin to the surplus of other corporations is not readily available for this purpose....It is not clear...that public confidence could be preserved should current necessary charge-offs be great enough to absorb all current income and also to require substantial recourse to the undivided profits account.... On the other hand, the public will accept with equanimity use of reserves for these purposes.[1]

At any rate, it is clear that one must look beyond the net-worth figure of the bank and examine the make-up of the accounts in order to be able to assess, in a practical sense, the amount of loss which a bank can absorb and still continue as a going concern.

Further Consideration of Bank Attitude toward Declines in Prices of Securities

Before closing this section, it seems justifiable to refer briefly to the question of the bases - logical or otherwise - of banker attitudes toward possible declines in the prices of variable-price assets. The traditional fear by bankers of such decline is vigorously assailed by Samuelson in an article which appeared near the end of the Second World War. Samuelson flatly asserts that both individual banks and the banking system would be "left tremendously better off" as a result of a general rise in interest rates: he finds a one percent across-the-boards increase in interest rates on government securities to be comparable to a gift to the banks of $60 billion or a perpetual annual subsidy of $600 million, based on the maturity distribution of bank holdings then current.

Computing the decline in capital value of these holdings

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[1]Rodkey, op. cit., pp. 108-109.

at 3.29 percent as a result of the one percent rise in rates, Samuelson continues:

> If the banking system maintains the same operating expenses and dividend policy, it will be able by ploughing back the new higher earnings to replace the three percent decrease in values in less than three years' time - without changing its proportion between longs and shorts expressed in value terms. This does not mean that in three years' time the banks will have got over the damage done them by rate increases. There is no such damage; from the very beginning banks are "really" better off; and at the end of three years, they are much better off because the old capital values can be invested to get twice the old yield [i.e., 2.08 percent instead of 1.17 percent].[1]

Samuelson takes no stock in the notion that deposits might decline drastically, explaining his reasons; although he does admit that individual banks might have to be careful.

Contrast this view with those of two well-known writers on bank policy, Rodkey and Atkins. The former states:

> It is sometimes argued that changing market quotations of money bonds can be ignored with safety....It would be... preposterous to insist on writing [book value] down with every market decline. Yet a major advance in interest rates eventually would force down market quotations of the typical bond portfolio of long-term money bonds to an extent which could not fail to be a matter of real concern.... Even though he may continue to retain the old values on his books the difference between such values and going market prices must be compared with the capital accounts available to cushion such declines.[2]

The "capital accounts available," as the term is used here, consists of total capital accounts less (1) par value of capital stock and (2) the capital cushion for the investment reserve and loans. The investment reserve he defines as "U.S. governments and other issues of AAA quality: (a) with maturities of one year or longer but not in excess of six years and spaced at

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[1] Paul A. Samuelson, "The Effect of Interest Rate Increases on the Banking System," AER, XXXV (March, 1945), p. 23. Italics in original.

[2] Rodkey, op. cit., p. 55. Underlining added.

as even intervals as possible, (b) readily marketable at all times at intrinsic values."[1]

A most careful reading of the context fails to disclose exactly why one is supposed to worry about declines in prices of bonds, especially in view of the fact that the bank is presumed to have not only primary and secondary reserves but even investment reserves - this last "to provide a ...defense against extraordinary developments that no banker can be expected to foresee"[2] - presumably making extremely remote the possibility of having to realize such losses.

This quotation from Atkins is similar in tenor to Rodkey's views: "Unrealized losses...are a constant danger and may well be a menace to a bank, for conditions may arise at any moment which may force their recognition, usually at a moment when it is the least convenient."[3] Here again is a passage full of foreboding, but there is no elaboration of these conditions which may occur "at any moment" to wipe out instantly all primary and secondary reserves, to exhaust all rediscountable paper and, in fact, to exhaust all assets upon which the bank could borrow, thus forcing it to sell its long-term investments regardless of loss incurred thereby. Thus there seems to be a wide gap between what Samuelson would counsel banks to do and what these two experts on banking policy would advise.

Professor Robinson sheds some light on why bankers behave as they do:

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[1] ibid., pp. 31, 56-59. [2] ibid., p. 32.

[3] Paul M. Atkins, Bank Bond Investment and Secondary Reserve Management, Bankers Publishing Company, p. 40.

> Banks often fear that customers may become jittery if they are aware of the fact that the market values of securities owned by the banks were below the levels at which the banks carried them on their books....Their [the banks'] apprehension about the market values is not so much logical as traditional....[The] existence of unrealized capital loss disturbs [the banker's] sleep, almost bothers his conscience. No amount of calm logic can wholly erase the feeling that this circumstance is bad and wrong.... Boards of directors take no more tolerant view of unrealized capital losses than bank officers themselves.... The emphasis on market values is probably overdone.[1]

With reference to the remarks about bank customers' reactions, it may be added that banks' big customers can ascertain the approximate market value of their securities through general knowledge of the financial markets, as noted a few pages above.

Thus, to state that the bankers' attitude of concern over possible declines in asset prices is baseless is to put the case a bit too strongly, considering the pressures (real and imagined) to which bank management is subjected from customers and directors. However, it is probably correct to state also that there exists a high degree of emotion in the attitude of practical bankers toward declines in market values of their investments. Regardless of the reasons for this behavior, the student of bank-firm theory must take it into account, avoiding the error of identifying actual behavior with pure rational behavior on the part of banks.

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[1] Robinson, Management of Bank Funds, pp. 315-316.

CHAPTER VIII

COSTS

The bank firm, no less than other firms, is influenced in its behavior by costs. Thus we can expect that prices of inputs will affect both the proportions in which these inputs are used by the bank and also the scale of its operations. In traditional analysis the firm is represented as seeking to use the various inputs in such a manner that the marginal revenue product attributable to each is equal to its marginal cost to the firm. In so doing, the firm maximizes its profits. Earlier in this study, however, it was indicated that the assumption of profit-maximizing behavior is not completely appropriate as applied to the bank. In what way does this fact affect the bank's use of the various factor inputs?

To the extent that banks compromise between liquidity and earnings, but at the same time have regard to their costs, attempting to substitute among inputs - e.g., machines for human labor, electronic posting machines for mechanical ones - whenever such substitution appears economically feasible, the above question can be answered in this way: a bank will stop short of the scale of operations which would equate the marginal revenue product and marginal factor cost for each factor, but the ratio of MRP to MFC will be equal for all factors and greater than unity. In other words, the bank firm may be considered to attempt to use the optimum proportions of inputs

but to stop short of the optimum scale. Changes in relative factor costs may be expected to change the relative amounts used, in so far as, and to the degree that, the proportions are variable, and also to change the product-mix, in so far as the products are not pure joint products and the factors are used in different proportions in the production of different kinds of output. Changes in the general level of costs (to be defined presently) may or may not affect the proportions in which the various inputs are used. The result will depend on (1) whether this change will affect the scale of operations and (2) whether such a change in scale will be associated with a change in the optimum input-mix.[1]

It seems advisable, since we are concentrating on those aspects of bank behavior that bear directly on balance-sheet variables, to limit our discussion of costs primarily to those that relate to the main items in the asset structure. Thus, costs of bank drafts, travelers checks, collection services, etc., as well as such non-banking departments as safety-deposit vaults, trust management, and rental of quarters in the bank's building, are ignored.[2] Costs of deposit-transfer and also deposit interest costs are considered given here because they are, for the most part, analytically separable from the costs associated with the assets themselves. The cost-

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[1]The scale effects of changes in costs will be taken up in Chapter XI.

[2]This does not imply that these costs are independent of costs associated with assets. The inauguration of a trust department, for example, may well result in a reduction of overhead assigned to the departments handling the so-called earning assets.

accounting problems of (1) how much of the overhead is to be assigned to the various loan, credit, and investments departments, etc., and (2) what the variable costs associated with various asset-mixes will amount to, are assumed to be solved, so that a functional relationship between costs and asset-mixes can be postulated. A further set of assumptions is required in order that these relationships may be assumed to have a degree of stability: the size-mix and maturity-mix of loans and investments remain unchanged. Both of these factors obviously can influence bank costs quite strongly, so these assumptions are necessary ones.

In analyzing the effects of costs on the pattern of bank assets, it will be desirable to distinguish between level and structure aspects, as was done in the interest-rate chapters. Definitions will be analogous. A change in the level of costs is defined as a roughly proportional rise or fall in costs associated with each asset-mix. A change in structure is defined as any change in relative costs associated with different classes of earning assets. Although a "pure" change in the cost level is hardly likely, in some cost shifts the level aspect predominates, and these will be discussed as pure cost-level changes.

If one were to construct a "cost surface," analogous to the preference surface of the Basic Diagram, he would find that its shape would be describable as rising (in the Z dimension) from left to right and from the X axis upward, with the highest point located at L/A=1.00. In other words, both classes of earning assets entail operating costs, with loans

being generally higher in such costs than investments, per dollar. Evidence is quite conclusive on this point. A National Bureau study, by Ernest A. Dauer, reached the following conclusions, based on data for all insured commercial banks:

> The influence of the proportion of total assets in the form of loans can be isolated by examining cost rates of banks with approximately the same rate of income on loans....[Data show] that average operating costs increase consistently and materially with increases in [this factor]. The higher cost rates found for banks with higher proportions may be explained by the fact that the investment of funds in securities, or their retention in the form of cash assets, entails less operating expense than the investment of funds in loans.[1]

Robinson furnishes some fairly specific estimates:

> Studies of bank costs show that lending may cost medium-size banks about ½ of 1 per cent of the funds employed, that this amount is somewhat less for big banks, and that it seldom exceeds 1 per cent even for the smallest banks....It is likely that the cost [of investment operations] is usually below ¼ of 1 per cent, possibly much below that in some large banks.[2]

Level of Costs

Following brief discussion of some of the major influences on the general level of bank costs, the effects of changes in the cost level will be analyzed.

Determinants

There are a large number of determinants of the cost level, some obvious and some less so. A partial list of the more important ones would include (1) interest rates on deposits,

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[1] Ernest A. Dauer, Comparative Operating Expense of Consumer Instalment Financing Agencies and Commercial Banks, 1929-1941 (New York: National Bureau of Economic Research, Inc., 1944), pp. 117, 119.

[2] Robinson, Management of Bank Funds, p. 394.

(2) deposit-mix, (3) the capital-to-assets ratio, (4) wage and salary levels and other input costs, (5) the input-mix, (6) technology, (7) total quantity of assets, given the asset-mix, (8) size and type-mix of loans, (9) average time-period of holding an asset, (10) types and rates of taxes, and (11) form of organization, branch or unit. These will be briefly treated now.

The influence of deposit interest rates and deposit-mix are plain. For our purposes, the credit allowed against service charges on demand deposits is considered equivalent to interest on deposits; but even so, it is evident that the greater the percentage of time to total deposits, the higher the interest cost. Deposit interest rates are not really "given" to the bank, but discussion of policy in this connection is deferred to Chapter X.

The capital/assets ratio will exert an influence similar to that of the deposit-mix, since there is no fixed expense in connection with the bank's capital, except for an occasional bank which still has some preferred stock outstanding - and even in this case the obligation to pay regular dividends is not legal but moral or based on the consequences to the controlling group of failure to pay regular preferred dividends; e.g., under certain arrangements preferred stock may have the right to vote if dividends are passed a specified number of times.

Factor costs and the factor-mix as determinants of the cost level need no elaboration. Unlike deposits, the factor-mix is susceptible of influence by the bank; hence, the influence of relative costs will be seen in the factor mix, as

was observed earlier. Changes in technology are closely related to the foregoing and also may induce banks to use different proportions of factors. A striking recent example of this in the field of banking is the development of electronic devices for speeding routine operations. In this area, the Bank of America's ERMA (Electronic Recording Machine-Accounting) is by far the most remarkable.

> ERMA does all the daily bookkeeping chores for 50,000 individual checking accounts....At designated periods, such as the monthend, it automatically calculates the service charge and turns out a complete printed statement for the customer at the rate of 600 lines a minute.[1]

There is scarcely an issue of banker's trade magazines in recent years that does not carry a general article or specific report dealing with some aspect of electronic accounting devices and other aspects of automation as applied to banking.

Total quantity of assets, the size- and type-mix of loans, and the average time-period of holding earning assets bear on total costs in an obvious manner, although only the general nature of the relationship between costs and any of these factors is known. It is clear that, other things being equal, cost should vary inversely with the average time an asset stays in the portfolio and directly with total quantity of assets. Similarly, we know that the cost level will vary with the size-mix of loans in a rather evident manner: other things the same, costs will be higher, the smaller the average loan size and the greater the relative quantity of high-cost forms of loans. However, it is not possible to go with

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[1] "B of A's Paul Bunyan Bookkeeper," Banking, XLVIII (November, 1955), p. 45. See also "Bank of America's Friend ERMA," Fortune, LII (October, 1955), pp. 131, 194.

confidence much beyond these rather general statements. We can chart the statistical relationship between size of bank and costs in a rough way, as will be seen in Chapter XI; but so many other factors vary along with size that we do not really get any conclusive evidence as to the relative efficiency of bank firms of various sizes.

Taxes may affect either the structure or the level of costs or both structure and level. Actually, this is the only category of bank costs which any attempt has been made to relate to bank behavior. But studies of the economic effects of bank taxation generally concentrate on the pricing of bank loans and deposits, along the lines of traditional incidence theory, touching only incidentally, if at all, on asset effects. This is to be expected, since not until comparatively recently have tax effects been generally treated by economists as much more than phenomena influencing prices and the allocation of resources, while all bank tax studies available are at least two decades old.

There are several types of bank taxes used by states in which the cost-level effects predominate. Beside taxes on bank real estate, most states levy a tax on bank shares. Other taxes consist of net income tax, franchise tax (based on net income), and the tax based on dividends.[1] Several states also impose a tax on bank deposits.[2]

In some cases, a tax may result in no additional tax

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[1]Harold M. Groves, Financing Government (4th ed.; New York: Henry Holt & Co., Inc., 1954), pp. 345-346.

[2]M.R. Schultz, American Public Finance (4th ed.; New York: Prentice-Hall, Inc., 1942), p. 521.

liability incurred by the bank. A tax on net income obviously results in tax liability only if net income, as defined in the particular state or Federal statute, is earned. Therefore, those asset-mixes which the bank does not expect to yield any net income will not be affected cost-wise, while the level of costs expected on the other possible mixes will be affected to the degree to which net income is expected to be earned. As another example, it is barely conceivable that the bank might succeed in passing on the entire amount of the tax in the form of reduced interest rate on deposits. However, if the interest elasticity of deposit supply is greater than zero, other effects are introduced and must be weighed against the cost reduction: decrease in total bank assets and, perhaps, unfavorable public sentiment.[1]

The relation between form of organization (multi-office versus unit) and the level of costs is, at best, obscure. As in the case of many other comparisons involving bank costs, several factors in addition to costs vary simultaneously with form of organization. In a study which included an analysis of comparative costs of these two types of bank organization, Alhadeff reached the following conclusions as to the relative efficiency of these two forms: "The alleged superiority of branch over unit banking holds, strictly speaking, only when branch banks are compared to any but the largest unit banks. Branch banks then have lower full costs and lower cost compo-

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[1] At this point we cannot stop to discuss other economic aspects of bank taxation - effects on loan pricing, bank capital, etc. - some of which are treated elsewhere in this study.

nents, with the possible exception of interest costs."[1] This last is explained by the fact that branch banks have higher time deposit/earning assets ratios due to their location, commonly in rural and small-town settings in which demand deposits are used relatively less.[2]

Effects on Asset Structure

At first thought, there would seem to be no reason to hold that the effects of a rise or fall in the cost level would not be the exact opposite of the effects of similar changes in the level of interest rates. A rise in the cost level, after all, would exert the same sort of influence on current earnings as a fall in the rate level. This, however, would ignore the important influence both of expectations as to future interest rates and of reactions of the bank to changes in asset prices. So, although the expectation of lower interest rates might cause the bank to feel well off in proportion to the amount of its assets in the form of reserves, expectation of higher costs would not normally cause a similar reaction, even if a subsequent drop in costs were expected.

In terms of the usual breakeven chart, an increase in the level of costs, cet. par., will move the bank's breakeven point to the right. If the bank is enjoying a comfortable level of earnings, the probability is strong that no significant change in asset policies will result from an increase in costs, unless the increase is quite drastic. However, if the rise in

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[1] Alhadeff, Monopoly and Competition in Banking, p. 106.

[2] ibid., p. 99.

the level of costs jeopardizes the bank's earnings position, it may be expected to assume a higher-risk asset position. For example, in discussing the effects of taxation on bank behavior, Kimmel states:

> It is probable that taxation may be a factor causing banks to depart from their proper field of activities. When a given method of taxation results in a substantial tax, regardless of the demand for funds in their usual employments and regardless of the income of the bank in the period to which the tax relates, funds may be employed primarily with a view to covering the tax and other expenses that are relatively inflexible. This tendency is not necessarily restricted to occasions when the usual demands for banking funds are low. For example, it is more than probable that the flow of banking funds from interior banks to the call money market in the period ended in 1929 was influenced by the tax factor....The same observation is applicable to investment in speculative foreign bonds which were purchased primarily because of the attractive nature of the yield.[1]

Kimmel goes on to explain that banks would not otherwise have sought these high yields because, as quoted in the introductory chapter of this study, "The average bank management is willing to pursue a conservative policy on risk assumed, so long as a moderate profit is obtained."[2] Although the reference concerns taxes, one can legitimately generalize.

Although Kimmel may be right in claiming that high taxes and other comparatively inflexible expenses induced banks to reach for yields, the force of his argument is considerably weakened by certain data on national banks presented earlier in this same study showing, between 1925 and 1929, declines in the ratios of tax to profits before tax, to capital funds, and to earning assets, and rises in the ratios of profits, both before and after tax, to capital funds and

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[1] Kimmel, op. cit., p. 120. [2] ibid.

to earning assets.[1] In fact, for all member banks, net profits as percent of total capital averaged higher in the second half of the 1920's than they have been for any similar period since that time.[2] Therefore, it can scarcely have been hardship and desperation which drove the banks to risk and subsequent ruin. Perhaps a more adequate explanation is found in the general climate of optimism which prevailed not only with respect to the stock market but to things economic generally.

From other sources, however, the evidence is strong that high costs do induce riskier positions on the part of banks. References cited in Chapter V contain some of these sources of evidence; one other may be mentioned. In a study by the National Industrial Conference Board, its author, after discussing some of the factors that make for the high cost of country banking, states that these factors "induce such banks... to select a relatively high percentage of high-yield, second-grade securities in their investment accounts."[3] Here, the comparison is between banks experiencing different cost levels at a given time, not that of a given bank at different times, but the conclusion reached is the same: higher costs - higher-risk assets.

The effects of changes in the cost level on asset preferences can be represented in terms of the model of the bank firm developed in Chapter IV. A general rise in costs will reduce the net yield associated with each asset-mix.

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[1] ibid., pp. 66-67, 70-71.

[2] Federal Reserve Bulletin, various issues.

[3] The Banking Situation in the United States, p. 88.

On the basis of empirical and other evidence, we can reason that the whole preference structure will be lowered (i.e., that the level of satisfaction associated with each asset-mix will be reduced) and that the most-preferred asset-mix (point P) will contain less reserves and more earning assets due to the influence on earnings position.[1] Changes in the make-up of the asset categories cannot be represented directly, but the obvious implication of the above analysis is that these will change in the direction of greater risk and gross yield.

A decline in the general level of costs may be expected to effect results directly opposite of those indicated above, so we need not go into this type of movement.

Cost Structure

As defined earlier, a change in the structure of costs involves a change in relative costs such that one or more classes of earning assets shifts relative to the others in costs associated with them. Following a brief treatment of determinants, the effects on the asset-mix of structural changes in costs will be examined.

Determinants

The factors that determine the structure of bank costs are of several general types. Some, like size-mix of loans relative to that of blocs of securities, are primarily peculiar

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[1] To secure more loans, the bank may have to lower rates and/or standards, which will further depress the preference structure in proportion to the loans/assets ratio at each point, as discussed in Chapter VI.

to the individual bank. Other factors, notably taxation, originate in government. Relevant characteristics of taxation include both the tax status of various earning assets relative to others (e.g., exemption from income taxation) and the relative tax rates affecting different earning-asset classes. Still other factors are manifestations of developments and trends in the economy to which the bank adapts itself. As an example of this type, consider a change in technology which reduces the relative cost of acquiring or handling a particular type of earning asset. Thus, in order for consumer instalment lending to be made feasible for the commercial bank, it was necessary that the bank adopt methods of quick appraisal of collateral and the routinizing of certain procedures in connection with these loans.[1] Another development affecting structure of costs is a change in relative prices of factor services, which might affect both level and structure of costs.

Effects on Asset Structure

It seems self-evident that an increase in the cost associated with one class of earning assets relative to others will eventually lead to a reduction in the percentage of that asset in the bank's asset structure, other things being equal. Thus, in a NICB study already cited, the author states that "high administrative costs [of lending] might lead to the avoidance of commercial and other loans to customers regardless of lower losses comparatively and higher interest rates."[2]

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[1] Jacoby and Saulnier, Business Finance and Banking, p. 151.

[2] The Banking Situation in the United States, pp. 130-131.

An increase in costs of one class of assets is at the same time a rise in the cost of all asset-mixes containing this asset, in proportion to the percentage of total assets represented by this asset. Therefore, the bank will tend toward the other types of earning assets, although the effect will be mitigated or accentuated somewhat by the "income effect," i.e., rising costs per se lower net yield. To illustrate, a rise in the costs associated with bank lending has the substitution effect of making investments more attractive, but this is counteracted somewhat by the "income effect" of pressure for more of the higher-yield asset. It is perhaps conceivable that this income effect will overpower the substitution effect; but this seems highly unlikely to occur because of the fact that the rise in costs of each earning-asset mix is proportional to the percentage of the high-cost type of asset contained therein. Therefore, to increase the L/A ratio involves not only an increase in total costs but an increase in the cost increment as well. In the case of an investments cost increase, both the income and the substitution effect work in the direction of enhancing the attractiveness of loans relative to investments.

A fall in the costs associated with either major class of earning assets may be similarly treated. A fall in loan costs will cause the bank to favor loans more, on substitution-effect grounds, but this influence might be reduced due to lessened pressure for revenue. A fall in investment costs, on the other hand, will lead the bank to shift toward investments on both substitution- and income-effect grounds.

As to the movement of the R/A ratio, there is the fact that the rise in costs of either major class of earning assets favors reserves on substitution grounds, but this effect may be counterbalanced due to income considerations. A fall in the costs of either loans or investments throws these two influences - the income effect and the substitution effect - into reverse.

No firm conclusions suggest themselves concerning the effects of cost-structure changes in the bank asset-mix. Evidence is scant and highly tentative. Further study is needed to shed light on the types of reactions that can be expected in response to various kinds of cost-structure changes; but possibly some of the right variables have been introduced and the proper questions posed.

CHAPTER IX

GOVERNMENT

The influence of government on the bank firm is so pervasive and important that, although certain aspects of it were covered in the foregoing chapters, such a large residue remains that it is considered advisable to devote a separate chapter to this factor. Even at that, only those actions of government which are specifically intended to affect the banking system are included. Thus, many aspects of government finance, agricultural policy, foreign economic and military policy, etc., are bypassed here, not because their effects on banks are unimportant but because the line, which needs to be drawn somewhere, is best drawn between policies which deliberately affect banks and those which incidentally affect them. And even as so defined, the dividing line is still by no means sharp; the following agenda has resulted from decisions with which there could, in some cases, perhaps legitimately be disagreement.

The chapter divides itself rather easily into two main sections. First, the role of government as a regulator of bank asset structure is discussed. Then follows a treatment of other avenues through which government influences the asset structure.

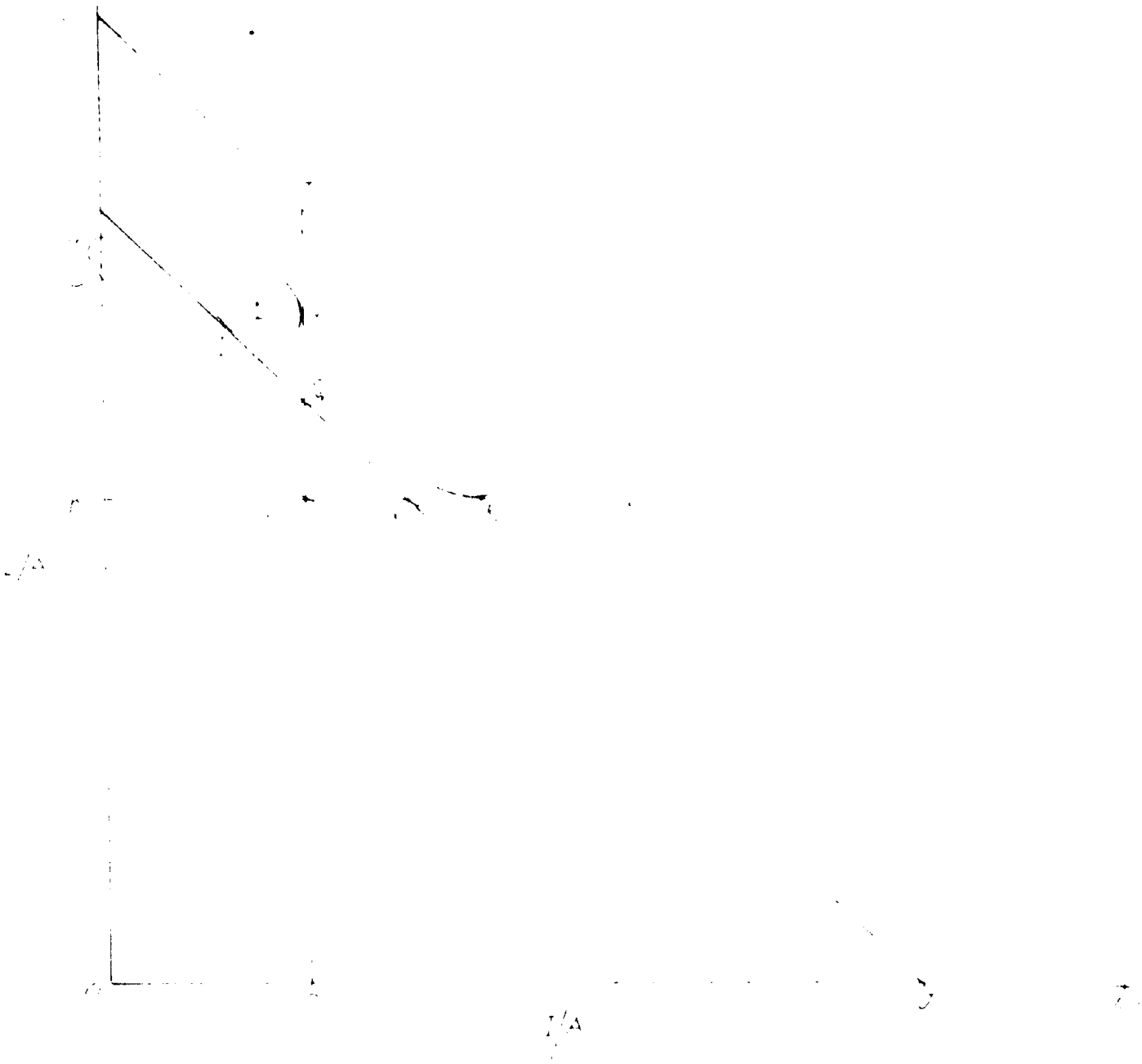
Role of Government as Regulator

In discussing the government's regulatory role with respect to bank assets, we use the term "regulation" in a narrow legal sense, implying direct attempts to influence

the quantity and quality of certain types of bank assets through requirements, restrictions, and prohibitions. We are not concerned here with those actions of government which influence the asset-mix via their effects on risks, costs, and interest rates, all of which were discussed in the foregoing chapters. Topics to be covered in this section are requirements as to minimum quantity of specified classes of assets, regulations as to type of earning assets, and regulations bearing on the quantity of earning assets of specified classes in the bank's portfolio.

Asset-Class Minimum Requirement

The minimum reserve requirements affecting commercial banks are the most familiar examples of this class of regulations They act as constraints on the bank's asset structure, requiring a certain fraction of total assets to consist of "legal reserves," as defined by law or administrative ruling. In terms of the Basic Diagram, reproduced as Figure 6, a required reserves-to-assets ratio of 20 percent would be represented by a straight line (HJ) running diagonally from the point on the Y axis where L/A=.8 to the point on the X axis where L/A=.8. Each point on this line, while describing a different earning-asset mix, will signify R/A=.2. If point P lies between this line and the origin, no pressure is placed on the bank by the reserve requirement to assume a different asset-mix from its preferred one. If, on the other hand, the bank would prefer an asset-mix with less than 20 percent in the form



of reserves, a true restriction on bank asset policy is felt: the reserve requirement imposes a "boundary maximum," i.e., a condition in which "the greatest value of the maximand...is found at the boundary,"[1] the maximand in this case being utility.

In actuality, the reserve requirements are not in the form described above. In the first place, they are usually imposed on the basis of deposits - or, more accurately, deposit-mix - rather than assets. And secondly, what is required is the maintenance of a specified fraction of some balance-sheet magnitude not merely in reserves but in legal reserves - a category not usually coextensive with reserves, as the term is used herein.[2] Thus, in a sense, the maximum is not generally found at the boundary, for such a condition would signify that the bank would desire to hold only legal reserves. These are, however, minor points. The general direction of effects of a change in the required reserve ratio will be the same in any case, so, for simplicity's sake, we assume in what follows that (1) all reserves are "legal" and (2) required reserves are related to assets only.

As we saw above, imposition of a reserve requirement need have no effect on the asset-mix if point P lies between the origin and the required-reserve-ratio line HJ.[3]

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[1]Boulding, Economic Analysis, p. 618.

[2]A few states even permit certain specified kinds of securities as a part of the bank's legal reserves.

[3]If, however, such an increase is interpreted as part of an effort to bring about credit restriction, the bank may react in the pattern of increased liquidity preference, with point P shifting toward cash and short-term assets.

However, if this line lies between P and the origin, there is strong likelihood that the bank will wish to become less liquid or "safe" by shifting its earning-asset structure. In terms of our simple three-asset model, the bank will want to grant more loans. Of course, if limited demand for loan accommodation also effectively imposed a constraint, the bank may be powerless to pursue such a policy.[1]

The effects of another constraint of the asset-class minimum type, an investments requirement,[1] also is portrayed in Figure 6; a vertical line ST running from a point on the X axis representing a required I/A ratio of 20 percent. Of course, such a requirement is usually put in terms of a specified class or type of investments rather than investments in general, but the principle is no different from the one being analyzed in the present case.

Figure 6, then, shows the combined effects of all three types of constraints: limited loan demand (KL), a 20 percent reserves/assets requirement (HJ), and 20 percent investments/assets requirement (ST). The area outside SWQJ if "out of bounds" to the bank by reason of legal or economic restraints. Within the open section the bank is free to maneuver; and it is apparent that the most desirable position is point Q, consisting of the maximum obtainable amount of loans, the minimum required primary reserves, and the rest in investments. In this

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[1] In actuality, another alternative is available which is not explicit in the three-asset model: the bank can alter the composition of a major class of assets in the direction of greater or smaller risk and yield.

case, the investment requirement imposes no "felt" limitation.

With the aid of Table 6, the effects of these three types of constraints, individually and in pairs, can be observed. Note that in every case the constraint is understood to be actually felt by the bank.

(1) When loan demand is limited, relative to the bank's willingness to lend,[1] the bank may be expected, in order to achieve a better balance between earnings and liquidity requirements, to move toward a lower reserves/assets ratio and consequently a higher investments/assets ratio (point R, where KL lies tangent to an indifference curve).[2] (2) Imposition of a reserve requirement, as mentioned above, will induce the bank to seek to reduce its liquidity and increase its earnings by means of a higher L/(L+I) ratio, e.g., point I, where the reserve-ratio line HJ is tangent to an indifference curve. If, however, the required ratio line is tangent to an indifference curve to the left of the Y axis, the tangency condition is not attainable. The best position is still zero investments but a more liquid condition than desired by the bank, since adjustments <u>within</u> earning-asset classes are ruled out. (3) An investments requirement alone would, of course, increase investments, since we assume that it is a true constraint. But it would also reduce both loans and reserves. If only loans

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[1] It is understood that the bank is already engaging in the optimum amount and form(s) of demand-stimulating activity, of both price and non-price types.

[2] The assumption is made that loans are considered riskier than investments.

were reduced, the total asset-risk position would be lower, as would expected earnings. And, if only reserves were reduced by the bank, the opposite conditions would result. Hence, it seems logical to hold that both classes will be affected, thus preserving a balance between earnings and liquidity demands. This condition is exemplified by point V, where ST is tangent to an indifference curve.

TABLE 6

EFFECTS OF VARIOUS CONSTRAINTS ON BANK ASSET MIX

Type of Constraint	Asset Category and Direction of Effect			Designation of Equilibrium, Figure 6
	R	L	I	
(1) Limited loan demand	-	-	+	R
(2) Primary reserve requirement	+	+	-	I
(3) Investment reserve requirement	-	-	+	V
(4) (1) and (2)	+	-	(a)	Q
(5) (2) and (3)	+	-	+	G
(6) (1) and (3)	-	-	+	B

(a) The higher the reserve requirement, given limited loan demand, and the demand for loans (short of P), given the reserve requirement, the greater the probability of a decline in I.

(b) No equilibrium depicted: see text.

Now we consider the somewhat more complex cases in which two types of constraints are imposed: (4) while both limited loan demand and a reserve requirement act individually

to curb bank loans, the second acts only indirectly when the two are conbined. The real limitation on loans is imposed by KL, the addition of HJ serving only to induce the bank to hold more primary reserves than it would otherwise prefer, i.e., to locate at Q rather than at R. From the nature of the case, reserves will be greater, and loans smaller, than would exist in the absence of any constraints; but investments could either expand or contract. As indicated in footnote (a) to the above Table, and as is quite obvious in any event, the higher the demand for loans (short of point P) given the reserve requirement, and the higher the reserve requirement, given the demand for loans, the more likely that investments will decline, i.e., that Q will lie to the left of P. The extreme situation occurs when K lies above H, which will signify zero investments. In that case, loan demand no longer offers a true limitation, and case (4) becomes case (2).

Case (5) offers no special problems, even though individually the two constraints appear to work at cross purposes. To constitute effective constraints, the reserve requirement must increase reserves and the investment requirement, investments. There is no possible direction for loans to move except down. Subject both to HJ and ST, the bank is limited to asset-mixes within the area defined by triangle SGJ; and the most desirable asset-mix is designated by G. Any other point within the triangle is inferior to G because, since the bank has more reserves and more investments than it would prefer - both assets

being considered inherently less risky than loans - it necessarily follows that the bank will, under these circumstances, grant all the loans permissible.

Case (6) combining an economic constraint - limited demand for loans (KL) with a legal one - and investments reserve requirement (ST) - will naturally produce a smaller loan account and a higher investments/assets ratio. Since this means a lower asset-risk position, it may be inferred that the bank will maintain a smaller amount of primary reserves. In order that both of these constraints might be effective, the bank must be induced by ST to hold more investments than it otherwise would but not to reduce its lending, for in that event KL would no longer be truly effective. An asset position that meets these requirements exists only when the point of intersection of ST and KL is located relative to the preference map in such a way that the indifference curve passing through this point has a positive slope. If ST intersects KL to the right of R, this condition is met: removal of the investment requirement would cause the bank to reduce its investment holdings to KR. Increase in loan demand would induce the bank to grant additional loans to the point where ST is tangent to an indifference curve. If the slope is zero, the indifference curve is tangent to KL, so no real constraint is imposed by KL. Where the slope is negative and the curve is in the range where curves rise in value moving away from the origin, only KL is effective. Such a position is found at W,

ST imposing no restraint since the bank is disposed to carry KR in investments, not merely KW as required as a minimum. Where the indifference curve passes through the point of intersection, has a negative slope, and is located within a range where curves fall in value moving away from the origin, KL imposes no constraint.

Restrictions as to Types of Earning Assets

A second general class of government regulations affecting bank asset composition comprised those that prohibit bank holdings of certain kinds of earning assets or, what amounts to much the same thing, restrict holdings to certain specified kinds. In this class belong two important sub-classes: (1) those relating to standards of quality, form of security, and general relationship between borrower and bank; and (2) those specifying terms upon which banks may make certain types of loans. It is not advisable in this study to go into great detail concerning these types of regulations; but, at the same time, enough should be included here so as to indicate the nature and scope of these regulations.

Federal and state regulations in this class vary widely, but the purpose is usually to limit the amount of asset-risk and total portfolio risk incurred by the bank.[1] In some cases the regulation will be positive in form, specifying permissible kinds of asset. The "legal lists" containing categories of

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[1] An important class of exceptions is made up of those selective credit controls the purpose of which is to alter the normal channeling of the flow of credit.

loans and investments which mutual savings banks may hold is an illustration. In other cases the regulation is expressed negatively. We now consider a few of the most important regulations that apply to banks under the jurisdiction of the Comptroller of the Currency and the Board of Governers of the Federal Reserve System or both, as illustrations of this type of restriction.

Standards of quality.--Member banks are, as a general rule, forbidden to own stock. The most evident exception is, of course, the requirement that each such bank own stock in its district Federal Reserve Bank in a amount equal to three percent of its (the member bank's) capital and surplus. Other exceptions are stock in a corporate subsidiary, on condition that (1) its sole purpose is owning and maintaining the bank building or (2) it was established to carry on the safe-deposit business or a foreign banking business. Even in these cases, the permissible stock holdings are limited as a percentage of the bank's capital stock or capital stock plus surplus. Member banks also may buy and hold common stock in the Federal National Mortgage Association, under terms of the Housing Act of 1954, which stipulates that a bank which sells mortgage loans to the FNMA must subscribe to its stock in an amount equal to three percent of the unpaid principal of the loans thus sold.

The foregoing illustrate situations in which banks may (or must) hold stock more or less permanently. In addition,

there are circumstances in which they may hold stock only temporarily. When a bank acquires stock in connection with the default of a loan, the stock must be disposed of within a reasonable time - "reasonable," that is, in view of market conditions. If the stock thus acquired is the bank's own stock, it must be disposed of within six months.

With regard to bonds, member banks are not permitted to invest in those that are "distinctly or predominantly speculative," a matter discussed earlier. Loans, too, are subject to certain prohibitions. To illustrate, a national bank may not lend on the security of its own stock, since this amounts to a reduction in its actual capital. Nor may a national bank make loans to bank examiners.

The "legal list" for mutual savings banks, compiled by the legislature or an administrative agency in most states having mutual savings banks, is a fairly strait type of regulation of bank assets. The list specifies certain classes of loans and investments, and standards of quality within these classes, which these banks may hold; and at times their asset portfolios have been strongly affected by the relative availability of securities satisfying the requirements thus imposed.[1]

Terms.--Restrictions as to terms of the contract between borrower and lender also fit into this general category,

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[1]Lintner, Mutual Savings Banks, pp. 214-216, and Paul M. Gregory, "The Mortgage Portfolio of Mutual Savings Banks," QJE, LXI (February, 1947), p. 252.

since they, in effect, disallow earning assets which do or do not contain certain terms. Some of these are designed to divert credit from uses which are inimical to government economic policy, usually on cyclical or emergency grounds. These include Federal Reserve Board of Governors' familiar Regulations U, W, and X covering, respectively, loans for the purpose of purchasing or carrying securities, consumer loans, and real estate loans. Only Regulation U remains in effect at present.

Other restrictions on terms are intended to limit risks assumed by the lender. For example, national banks may not make loans secured by a second mortgage, loans on unimproved property, or a real estate loan which matures beyond twenty years or which is not fully amortized in 20 years or which is for an amount greater than two-thirds of the appraised value of the property pledged. Loans insured by FHA or VA are exempt from these provisions.

Evaluation.-- Efforts to restrict banks as to the degree of credit-risk in their assets are not without their difficulties and dangers. In the first place, there is the tendency to shut the barn door after the horse has left, so to speck. This is illustrated by the case of regulations of security loans. Pearson Hunt "found no law prior to 1933 which limited the ability of member banks to accept stocks and bonds as collateral for loans."[1] Then, as the result of the findings

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[1]Pearson Hunt, Portfolio Policies of Commercial Banks in the United States (Cambridge: Harvard University Press, 1940), p. 36.

of a 1931 Congressional investigation, the Banking Act of 1933 gave the Federal Reserve Board considerable authority to regulate securities lending. In the second place, and related to the first reason, is the fact that the riskiness of an asset of a certain class may depend on economic conditions, as we observed in Chapter VII. Regulation thus tends to lose touch with economic realities, being unduly repressive in some directions, not strict enough in others. And, thirdly, banks will tend to seek other outlets for funds, possible innovating in the process, if they are barred from attaining an equilibrium risk-yield position because of restrictions applied to "traditional" outlets for their funds. For example, the increase in bank willingness to grant term loans was due in part to the changed character of bank investment portfolios that took place beginning in the 1930's, which change was due in part to regulations affecting the quality of securities which banks were authorized to purchase.[1]

Role of examiners.-- These various restrictions as to types of assets permitted or forbidden are felt by the banks not only in the form of statutes and administrative regulations but also - and more subtly - in the form of rulings and ex-

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[1]Prochnow, op. cit., pp. 182-214, and Jacoby and Saulnier, Term Lending to Business, p. 27. A more striking example of this type of compensatory adjustment is furnished by commercial finance companies during World War II, some of which, in response to the shortage of their usual types of assets, acquired manufacturing and other ventures. See Jacoby and Saulnier, Business Finance and Banking, p. 198.

pressions of opinions or attitudes of bank examiners. The effects of examiners upon bank assets is not, however, so absolute as are the other two forms of restrictions; so it was decided to include that factor in the discussion of risks rather than of restrictions. To put it another way, in so far as the examiner's rulings are solidly based on known administrative regulations or on statutes, he is merely an enforcing agent; but in so far as he is granted, or assumes, a degree of independent authority, the examiner constitutes a separate influence on asset policies, but hardly a constraint in the sense used herein.

Depiction on the Basic Diagram.--It is instructive to trace the effects of this class of regulations on the Basic Diagram. The purpose of both stipulations as to standards of quality and regulation bearing on terms of the lender-borrower agreement is basically the same: to reduce the credit-risk of the bank portfolio below what it would be in the absence of such regulations. Assuming that the desired result is attained for both loans and investments, (1) the preference structure changes to represent lower utility associated with each asset-mix as the bank is restricted to loans and (2) the loan-demand line (KL) moves downward, indicating that part of the total demand for loans from this bank no longer "registers." Since the bank is barred from seeking riskier, higher-yield assets, it presumably will attempt to compensate through (1) reducing its R/A ratio, (2) lengthening maturities in its

investment portfolio, substituting money risk for credit risk, and (3) perhaps stepping up its competitive efforts - price and nonprice - to secure more loan business, if KL lies a distance below P. The first will be used if the result will be to move the bank to a higher indifference curve; the second, if the result will be to raise the preference surface; the third, if KL is moved upward, away from the X axis, enough to compensate for a lowering of the preference surface due to (a) lower interest returns on loans and/or (b) increased costs associated with advertising or other nonprice efforts to increase loans.[1]

Quantity Restrictions

Banks may be permitted to hold certain types of assets but still be limited as to the permissible amount. This limit is generally expressed in percentage terms, relating the amount of the asset to capital or to capital plus surplus. Actually, this class of restrictions is simply the opposite of the asset-class-minimum type: in the latter case, a minimum is stipulated; in the former, a maximum. In the class of quantity restrictions belong such items as (1) the limitation on real-estate mortgage loans of a national bank to an amount equal to its capital and surplus or to 60 percent of its time deposits, whichever is

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[1]The utility of each asset-mix will probably be higher if, through augmenting its loan business, the bank also succeeds in increasing permanent deposits, hence total quantity of assets.

the larger, and (2) the limitation on the amount of stock held in bank's subsidiaries, as discussed earlier.[1]

A closely related form of quantity restriction applies not to classes of assets but to total amount of claims against an individual borrower. This is exemplified by the so-called "ten percent rule" which forbids the bank to make loans to any borrower or to hold securities of any issuer in an amount totalling more than ten percent of the bank's capital and surplus, with certain specified exceptions, the most important of which is the exemption of United States Government securities.

Anticipating somewhat the later discussion on determinants of the size of the bank, it might be mentioned here that this ten percent limit has been cited as a reason for bank mergers, since the combined bank can obviously make larger loans than its components could. However, it is a moot point whether the legal limitation itself is the determinant or whether it is the risk factor behind the limitation which would often limit the size of the individual loan or line of credit even without the legal stipulation. As a case in point, Jacoby and Saulnier note that, in making term loans, "Banks infrequently lend /to/ individual borrowers up to the legal limit, preferring to split very large loans with other institutions."[2]

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[1]The amount invested by the bank in its premises also is generally limited. For example, national banks are limited in this regard to an amount equal to paid-in capital, unless the Comptroller of the Currency specifically authorizes an exception.

[2]Jacoby and Saulnier, Term Lending to Business, p. 7. The word "to" in brackets was omitted, probably inadvertently, in the text cited.

A third type of quantity restriction is illustrated in the authority of the Board of Governors of the Federal Reserve System over securities lending. Here, the member banks are given no specific instructions relating to the percent of (earning) assets that may consist of securities loans, but rather the Board has discretionary authority to censure individual banks with regard to their holdings of this type of paper. As provided in the Banking Act of 1933, the Board of Governors (at that time, the Federal Reserve Board) has authority (1) to limit, by District, the percentage of member-bank capital and surplus that could be represented by securities loans and (2) to curb securities lending of member banks, with penalties ranging from denial of rediscount privilege to removal of officers and directors of offending banks.

The effect of the first of these three types of quantity restrictions, as represented on the Basic Diagram, is to impose a constraint on a certain class of loans, e.g., real estate. Thus, line KL, here describing permissible holdings of real estate credit, moves not all the way to the X axis, representing outright prohibition of this type of loan, but to a level determined by the bank's capital and surplus and time deposits. The asset-mix adjustment, again, cannot be adequately depicted; but, if the constraint is actually effective so that the bank feels this restriction, the adjustment may be expected to be in the direction of compensating for this restriction by means of asset-mix adjustments increasing risk and yield in other directions.

The second type of quantity limitation, affecting the amount that can be advanced to an individual borrower, either through direct lending or through open-market securities, may have the general effect on the Basic Diagram of lowering total demand for loans (KL), in so far as the bank has (potential) customers that would prefer to borrow more but whose demand simply does not register beyond a specified amount, as determined by the bank's capital and surplus.

The third sub-class does not affect demand for accommodation bu rather the bank's attitude toward such demand. In other words, it affects the bank's preference structure, as depicted on the Basic Diagram. Where L represents, say, security loans, knowledge that the Fed looks with disfavor on security loans and fear or knowledge that the bank may be on the brink of censure will move point P downward, describing a decline in preference for this type of asset. In order for the restriction to be effective, point P must lie below line KL, the latter representing demand for security loans.

Interest Rate Regulation

The scope of this section being limited to regulation of bank assets, the only relevant activities of government relating to interest rates concern ceilings imposed in the form of usury laws and small-loan laws. Interest rate ceilings obviously do not affect the asset structure directly; rather, it is through their influence on relative attractiveness of different types of assets that these laws operate, much the same

as do restrictions on terms relative to quality (riskiness) of assets, as discussed above. For example, usury laws had the effect of delaying the entrance of commercial banks into higher-risk, higher-cost areas of lending, such as consumer instalment credit,[1] collateralized business loans and small term loans.[2] And it is reasonable to surmise that small-loan legislation exerts an influence on the location of such activities.

Usury laws can be circumvented in some instances by various types of additional charges levied in connection with the loan. A study of bank lending to farmers, conducted by the Federal Reserve a few years ago, brought out this fact.

> Over four-fifths of the banks making farm production loans in 1947 had some minimum interest charge. The most common minimum was between 50 cents and $1.00. Since many of the farm production loans were quite small in amount and for short maturities, the existence of a minimum interest charge sometimes resulted in a high rate when computed on an annual basis.[3]

In addition, supplementary charges are usual, involving legal, recording, and notary fees in connection with chattel mortgages.[4]

Aside from farm production loans, it is not known how general these practices are.

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[1] Chapman and Associates, op. cit., p. 22.

[2] Jacoby and Saulnier, Business Finance and Banking, p. 214.

[3] Tynan Smith and P. T. Allen, "Commercial Bank Loans to Farmers," Federal Reserve Bulletin, October, 1947, p. 1221.

[4] ibid.

> It is true that some banks charge investigation or service fees or charge interest on the full amount of loans to maturity, although they are amortized through periodic repayments. Nevertheless, many banks do not make high-risk or high-cost loans because of uncertainty as to their legal position should they adopt the use of one of these artifices.[1]

Thus, even though it would be a mistake to ignore these devices for circumventing the intent of interest-rate legislation, it would be as great a mistake to conclude that these statutes are thereby rendered of no effect.

Other Direct Means of Government Influence

Since reference has been made in preceding chapters to governmental impact on bank assets via effects on interest rates, risks, and costs, the devices used in those connections will receive only passing mention. There are a few government activites, however, that are not properly treated under any of these headings; these will receive due attention later in this section.

Devices Affecting Interest Rates, Risk, and Cost

In the chapters on interest rates, we examined Treasury and Federal Reserve impact on availability of credit and, hence, interest rates via debt management and quantitative credit control devices. Risk is influenced by such varied factors as (1) examples of Federal lending agencies in acquainting banks with certain novel types of lending; (2) participation, guarantee, and insurance affecting certain classes of loans;

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[1]Jacoby, op. cit., p. 257.

(3) offer of rediscount privilege, repurchase, status as collateral, with reference to specified classes of earning assets; (4) provision of certain risk-reducing services by the Federal Reserve, such as collection of notes and provision of certain types of information; and (5) examination procedures which may cause banks, particularly smaller country banks, to be wary of certain assets on which it is feared that examiners will frown. Under the heading of cost may be listed (1) the free services performed by the Federal Reserve in connection with clearing, collection of out-of-town notes, and currency shipment, and (2) taxes, by all levels of government.

Government as Competitor

The influence of government in its role of competitor is pervasive in scope, having grown in response to several types of pressures. According to Jacoby:

> Four basic reasons underlay the creation of Federal loan agencies: (1) subsidy and support of secularly declining industries; (2) stimulation of investment during periods of underemployment; (3) meeting financial emergencies, presumably temporary in nature; and (4) promotion of national defense.[1]

No wonder, then, that Federal lending has played quite an important role. However, to say that all loan programs thus stimulated are directly competitive with commercial banks would be grossly incorrect: the effect of some government lending activities has actually been to increase the demand

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[1] ibid., p. 251.

for bank credit.

> The total net effect of Federal lending has undoubtedly been to expand commercial bank loans. Federal credit has maintained and supported private credit institutions by direct lending and by relieving them of assets believed to be illiquid or undesirable. By injecting credit at various points in the economy, Federal agencies have also raised the level of production and the demand for private credit.[1]

Therefore, in the following discussion it should be remembered that, in referring to the government as a competitor of banks, we are merely describing and analyzing one aspect of the total relationship between the banking system and the government, particularly the Federal level.

Government competition in lending affects the bank asset-mix primarily via influence on interest rates and on demand for loans. In the former case, the effect at times resembles that of a usury statute in that the rate set by an agency of the government on a certain type of loan may become the ceiling rate for banks. For example:

> Loans made by the Production Credit Association are effective substitutes for many bank agricultural loans, and, therefore, bank rates on such loans must compete with PCA rates.../For/ loans of 'moderate' size, Production Credit Association rates establish not only the ceiling but the actual rates at which commercial banks, including branch banks, actually lend in normal operations .../But/ for borrowers whose financial standing gives them alternative sources of supply, rates may fall below the ceiling rates of the federal lending agency.[2]

In the case of usury laws, the would-be borrower whose application is rejected by the bank for the reason that the

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[1] ibid., p. 253.

[2] Alhadeff, Monopoly and Competition in Banking, p. 126.

usury rate is not sufficiently attractive to the bank is usually either barred from credit or is forced to seek accommodation from a higher-cost, higher-price loan source. However, in the case of a de facto ceiling on bank rates as a result of government competition, the rejected borrower can often get funds from the government at the same interest rate.

It is not possible to assess accurately the effect of government interest rate practices on rates charged by private agencies since numerous influences on interest rates are always at work. However, it is the belief of students of the subject that farm lending agencies pushed rates down in that field and that the Home Owners Loan Corporation, during its existence, exerted a significant influence toward lower rates on home mortgages.[1]

The effects of government competition on the demand for bank loans have been "spotty," being quite potent in some areas of the credit market and during certain time periods. Percentagewise, the impact of government competition has been felt mainly in the realm of farm credit, particularly farm mortgage credit, although the importance of government lending has lessened in this area. At the beginning of 1937 and 1940, the Federal Government held 42 percent of the total farm mortgage debt, while when 1955 began, this percentage

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[1]See Everett G. Walk, Loans of Federal Agencies and Their Relationship to the Capital Market (Philadelphia: University of Pennsylvania Press, 1937), pp. 235-237, and references cited therein.

was only 19.[1] Another area in which the federal government was very active as a lender during the depression was home mortgages. However, in this field, too, the government's role has been declining. Even when and where Federal agencies were most active as lenders, such figures as given above tend to create an erroneous impression of competition. "In each field of credit, the Federal agencies have tended to take the marginal and sub-marginal loans, involving higher costs of loan administration or larger risks than private agencies were willing to assume."[2]

In the field of business lending, Jacoby and Saulnier expressed the view in 1940 that, since both Federal agencies and commercial banks were catering mainly to small and medium-sized concerns and since commercial banks were increasing their term lending, competition between the two was increasing.[3] Then, of course, the war lending agencies pushed the Federal government farther into the business credit field. However, with the advent of peace, the government rather quickly left the field to private financial institutions; and, at present, the prospect of intense competition between the

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[1]United States Department of Agriculture, Farm-Mortgage Credit Facilities in the United States, Miscellaneous Publications no. 478, 1942, p. 12, and Annual Balance Sheet of Agriculture, cited by Raymond P. Kent, Money and Banking (3rd. ed.; New York: Rinehart & Co., Inc., 1956), p. 758.

[2]Jacoby, op. cit., p. 256.

[3]Jacoby and Saulnier, Business Finance and Banking, p. 127.

banking system and the Federal government seems remote indeed.

Additional Government Influences on Bank Asset Structure

Two other influences are worthy of brief mention: moral suasion and government deposits.

It is generally agreed that in such a banking system as ours, consisting of nearly 14,000 commercial banking firms, the influence of moral suasion is comparatively slight. Only under certain circumstances can it be expected to exert significant influence independent of other weapons.

In addition to the indirect effect of inducing banks generally to maintain a more liquid position than would otherwise be the case, the presence of government deposit liabilities exerts a rather obvious direct influence on the asset-mix of the depository bank: generally, government bonds must be pledged as backing for such deposits. Thus, some banks may not be able to purchase all the tax-exempts they might wish, on income-tax grounds, because their public deposits must be "backed."[1] And, according to a study of non-metropolitan banking in Minnesota, the fact that public deposits accounted for a larger percentage of total deposits in these banks than in city banks helped bring about the condition that "in the main the unpledged bonds were inferior...practically all the high grade bonds in rural banks /being/ pledged."[2]

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[1]E. B. Chapin, "Factors Affecting Bank Investment Policy" Commercial and Financial Chronicle, CLXXIV (September 27, 1951), p. 1163.

[2]Tout, op. cit., in Stevenson, op. cit., p. 13.

Effects on the Basic Diagram

Moral suasion, to the degree to which it is effective, changes the bank's asset-preference pattern, shifting the preference structure in the direction desired by government. Government deposits, on the other hand, have the effect of imposing a "minimum government bond" requirement on the banks affected, similar to an investment requirement but on the basis of public deposits, not assets or total deposits. However, since these assets are definitely pledged and, hence, not available for the ordinary liquidity needs of the bank, the effect on the Basic Diagram will be different. Rather than attempting to acquire riskier, higher-yield assets to balance the effects on risks and earnings of an investment reserve, the bank in this case will probably be induced to achieve a somewhat more liquid position than otherwise would be the case, due to possible fear that its depositors, particularly the larger ones, will insist upon adequate liquidity safeguards and due to the fact that the pledged assets are probably below-average in risk and yield.

The direct effects of government loan competition are felt mainly as a downward movement of the loan-demand line (KL) and a shift in the preference structure away from the class(es) of assets whose yields have been reduced as a result of this government intervention.

CHAPTER X

THE LIABILITIES STRUCTURE

Up to this point, the liabilities side - defined to include ownership equity - has been treated simply as one of the determinants of bank asset policy. However, considerations of realism demand that account be taken of the means by which, and the extent to which, the bank is able to alter its liability-mix and also of the forces which induce the bank to take such action. These matters will be the subject of this chapter.

The problem of the liability-mix is one that seems to have been neglected or, at best, given only cursory treatment by writers in the rather underdeveloped area of asset theory. Most or all of these writers explicitly recognize that the balance sheet has, of course, two sides; but in their discussions the examples and even the generalizations tend to apply to assets only. In one such study, by Makower and Marschak, assets are defined as "physical goods or claims which give rise to yields. Debts are negative assets... yields are defined as amounts consumed."[1] But no flow concept applying to liabilities is introduced. Also, the "properties" of (positive) assets are discussed at length, but no mention is made of those of liabilities. One can ascertain throughout the article that the authors are evidently thinking in terms of positive assets almost entirely.

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[1]Makower and Marschak, op. cit., p. 263.

Hicks, too, in his "A Suggestion for Simplifying the Theory of Money," scarcely mentions liabilities. Seemingly conscious of this, he adds a footnote: "I am aware that too little is said in this paper about the liabilities side of the...balance sheet. A cursory examination suggests that the same forces which work through the assets side work through the liabilities side in much the same way. But this certainly requires further exploration."[1]

Even Boulding's A Reconstruction of Economics gives very little space to the liabilities side, specific reference to liabilities on the microeconomic level being largely limited to an introductory discussion of the balance sheet and types of changes therein and, later, references to incurring debt, in the chapter on "Expectations, Gambling, and Insurance."[2]

It seems likely that decisions involving the liabilities side may have important consequences for the economy[3] and that, therefore, the determinants of such decisions are an appropriate subject for asset theorists. At least, bankers' decisions regarding liability structures are of evident importance, so it would be inadvisable to neglect

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[1]Hicks, op. cit., p. 14.

[2]Boulding, Reconstruction of Economics, pp. 29-33 and Chapter 7.

[3]Cf. Edward S. Shaw, "Monetary Policy and the Structure of Debt," AER (Papers and Proceedings), XLIV (May, 1954), pp. 471-478.

this aspect of the preferred balance sheet in this study of the bank firm.

Reversing the setting of the foregoing discussions, in this chapter the asset structure is regarded as given. This will enable concentration on the liabilities side alone. Where appropriate, however, interactions between asset-structure and liability-structure preferences will be pointed out. First, considerations involving debt-type liabilities - namely, the deposit-mix and bank borrowings - will be discussed. Then follows a treatment of the capital-to-assets ratio and the capital-mix. While it is recognized that such devices as borrowing, selling stock, retaining earnings, and their opposites have an influence on the total quantity of bank assets, the size-effect is generally of very minor importance as compared with the liability-mix aspects of these devices. Therefore, they are treated in the present chapter rather than in Chapter XI.

Deposit-Mix

Several factors influence the bank's preference among alternative deposit-mixes. The reserve requirement is one of these. Other things being equal, a lower reserve requirement for time deposits as compared with that for demand deposits means that a larger fraction of total time deposits may be committed to earning assets.[1] Opposed to this is a

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[1] Hunt, op. cit., p. 30.

second factor: the interest rate on deposits. Since no interest may be paid on demand deposits,[1] this second factor enhances the relative attractiveness of demand over time deposits. In the case of Postal Savings deposits, many banks refuse to accept these deposits, in part because of the requirement that banks must pay 2¼ percent on them.

A third and related consideration is the complementary relationship between demand deposits and loans. Since banks usually have a preference for loans as earning assets, an association between demand deposits and loans will cause banks, for that reason, to prefer a deposit-mix with a higher ratio of demand deposits to total deposits than would be the case in the absence of such an association.

Risk of withdrawal is a fourth factor influencing the bank's deposit-mix preference. This factor would tend to cause the bank to favor time deposits under ordinary circumstances. In fact, it would cause <u>small</u> time deposits to be favored, other things being equal. The relevance of this influence is pointed up by the fact that, for safety reasons, mutual savings bank laws nearly always set ceilings on the amount of deposits these banks can accept in any one account,

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[1] Actually, an offset to service charges computed on the basis of average or minimum balance amounts to interest on demand deposits, but the rate is lower than interest on time deposits.

the only major exception being Pennsylvania.[1]

A fifth factor is the requirement of a pledge of securities. As mentioned in the preceding chapter, this pledge is generally required in the case of general government deposits, but it is also required on that portion of Postal Savings deposits held in a bank in excess of the amount insured by the FDIC, $10,000 at present. This is another reason, incidentally, for banks' reluctance to accept Postal Savings deposits.

Finally, the asset-mix is itself a determinant of the bank's attitude toward its deposit-mix. Although the causation may seem to run the other way - i.e., the larger the time deposits/total deposits ratio, the freer the bank feels about placing funds in longer-term, less liquid assets,- we have observed earlier that the bank may feel constrained to make certain commitments which it regards as advisable for long-run reasons, thus making the preferred deposit-mix the dependent variable to a certain extent.

There are several expedients used by the bank which have the effect of changing the deposit-mix. A list of these might include changes in the following: interest on time deposits, the schedule of service charges, the requirement of compensatory balances, and efforts to acquire new loan business. Since these are usually intended to produce a change in the total volume of deposits, discussion of them is post-

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[1]Lintner, Mutual Savings Banks, pp. 148-149.

poned to the following chapter.

Bank Borrowings

The theory of bank borrowing has been treated extensively in the past few decades,[1] so no attempt will be made here to add substantially to this topic. Fortunately, there is a large area of agreement on this subject, too, so we will be spared much controversy. The appearance of disagreement in discussions of bank borrowing is often created by the use of the terms "need theory" and "profit theory" as applied to the reasons for borrowing; however, a careful reading of the literature will fail to disclose any adherents to either view in pure form. Thus, as will be seen, most disagreement seems to lie in the emphasis placed on one or the other of these two "theories." In the following discussion we attempt to identify the important factors that determine the quantity of bank borrowing - whether from the Federal Reserve Banks or from other banks - and in so doing we shall be quite eclectic, since no dogmatic "all or nothing" position with respect to any one approach to borrowing appears justified.

It might seem that the first item on a list of determinants of bank borrowing should be "need" - i.e., need for additional reserves. Reserves having been depleted somehow, the bank borrows from another bank, usually a Federal Reserve

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[1] See especially Riefler, op. cit, Chapter 2; Burgess, op. cit., Chapter 14; B. Laughlin Currie, The Supply and Control of Money in the United States (Cambridge: Harvard University Press, 1934), Chapter 8; and Turner, op. cit.

Bank in the case of members, to restore its reserve position. This seems to be the essence of the need theory. However, to state that banks borrow because of need is not sufficient: one should know both (1) how the need came about and (2) why, of all sources of reserve funds, the bank chose this particular one.

With reference to the first point, Turner has criticized the concept of "need" put forth by Riefler on grounds that it is too loose, since it covers borrowing due to any reserve deficiency, not only that due to "legitimate lending."[1]

> The high correlation between money rates and discounts indicates that the necessity to replenish reserves has been an important factor in the determination of money rates, but it gives no clue as to whether the borrowing was for need [in the narrower sense]. The necessity to replenish reserves might be the result solely of the operation of the profit motive, and in the all-inclusive definition of borrowing for need, borrowing for profit is simply one of the varieties of borrowing for need.[2]

In order to discuss the second point, the reasons why borrowing is chosen rather than some other alternative source of reserves, we face the broad question of motivations - cost, risk, and others - behind bank behavior in this regard. Since this question is the subject matter of the rest of this section, discussion is deferred. Thus, while "need" must be rejected as a specific reason for borrowing, it does open the

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[1] Turner, op. cit., p. 86.

[2] ibid., p. 87.

way for analysis of more definite reasons, including (1) profit, (2) long-run customer relations, (3) fear of reaction, and (4) tradition.

Immediate Profit

The first specific determinant of borrowing is the motive of immediate profit. There are two senses in which the term "borrowing for profit" can be used. One is borrowing for the express purpose of relending whenever the marginal cost of money-services obtained through borrowing is less than the marginal revenue from the sale of money-services. The other sense is borrowing whenever the obtaining of such funds appears to be the least costly means of overcoming a deficiency in reserves. It is in the latter sense that the term is usually used; but the former usage is also worth brief comment since strict profit-miximization seems to suggest it.

There is good reason why we would not expect profit-maximization, in the first sense, to make much difference in total bank borrowing. In the case of open-market loans it is highly unlikely that the spread between the rediscount rate and open-market rates would be great enough to make profitable the borrowing of funds in order to relend on the open market because, not only must the interest cost be calculated - usually high relative to deposit interest cost - but also the secondary liability assumed by the bank in endorsing paper, a service for which it usually charges one or one and a half

percent, on an annual basis, due to the extra risk entailed.[1] Also, the rediscount rate has seldom deviated from open-market rates, including call rates, by more than one percent in the last two decades. However, suppose that the rediscount rate and the rates on at least some classes of open-market loans were such that a bank could realize a profit by borrowing to relend; what then? A hint of an answer is contained in this quotation from Riefler, himself considered an apostle of the need theory:

> Should rates in these [i.e., call and time loan] markets be above discount rates...banks would be inclined to lend surplus funds somewhat more freely, because of their ability to obtain funds from the reserve banks without loss, should unexpected demands arise before the maturity of the loans.[2]

Although he adds that "Such use of the discount facilities of the reserve banks does not necessarily constitute direct borrowing for the purpose of lending at a profit,"[3] it is almost indistinguishable from such borrowing, since the bank presumably increases its securities loans due to the spread between the rates on these loans and the cost of borrowing at the Fed. Therefore, the lack of importance of this type of "borrowing for profit" as applied to open-market loans is probably due more to the actual relationship

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[1] ibid., p. 79.

[2] Riefler, op. cit., p. 35.

[3] ibid.

between such rates and the rediscount rate than to the lack of profit motive on the part of the banks.

Then, in the case of customer loans, there is the added factor of long-run customer relationships to render unlikely any attempt to vary borrowings in accordance with the spread between the rediscount rate and customer loan rates. It may be, again, that cheapness and ready availability of additional reserves will lessen inhibitions with respect to further lending, but it is difficult to imagine that, following a rise of one-half percent in the rediscount rate, the banks will declare certain loans no longer profitable and therefore will deny them renewal.[1]

Taking the second and more common version of the profit theory, we find some evidence that banks do indeed borrow to restore depleted reserves when this appears to be the most advantageous source of such funds. It is at this point where the need and profit theories appear almost to merge. Two quotations, one from Turner and one from Riefler, will make this point evident. Turner offers the following as a statement of the profit theory:

> When faced with a deficit (or excess) in reserves, banks will adjust their reserve position either through increasing (or decreasing) borrowings, or decreasing (or increasing) open-market loans, and the decision will rest upon the relative costliness of the two alternatives, to the effect that the volume of borrowing will be a function of the profitability of open-market loans relative to the

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[1] The foregoing discussion omits any consideration of the "psychological" effects of rediscount rate changes, being concerned solely with cost and revenue matters. However, see subsequent section on "Tradition."

discount rate.[1]

Riefler, a "need" theorist, makes this observation:

> /It/ seems highly probable that member banks when they borrow and when they adjust their operations to repay their borrowing are affected to a certain extent by its cost in relation to money rates in the market. Evidence that such considerations as these have been in some measure effective can also be found in the behavior of money rates. /These show less fluctuation since the advent of the Federal Reserve; this is due in part to/ the fact that some member banks have borrowed more freely from the reserve banks in times of seasonal strain, when money rates are higher than discount rates and consequently yield a profit on such borrowing.[2]

Other need theorists also could be quoted to the effect that profit considerations play a part in borrowing.[3] Apparently the point at issue is the relative importance of various factors affecting bank borrowing; and this appears to depend on the type and location of the bank and also the economic conditions prevailing, as will be enlarged upon below.

Long-Run Customer Relationships

The second determinant of bank borrowing has already been alluded to: considerations of long-run customer contacts. Again assuming borrowing to be the most advantageous means of acquiring needed reserves, the bank will very likely "go out on a limb" with respect to its reserve position in order not to risk losing a valuable customer, regardless of immediate

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[1] Turner, op. cit., p. 96.

[2] Riefler, op. cit., p. 34. See also U.S. Congress, Joint Committee on the Economic Report, op. cit., I, p. 392.

[3] Cf. Burgess, op. cit., p. 227, and Currie, op. cit., p. 97.

profit or loss due to the difference between borrowing cost and lending revenue.

Fear of Reaction

Third is the fear of the reaction of the bank depositors, suppliers of borrowed funds, or regulators. This factor acts to curb the amount of borrowings and the length of time for which the debt is outstanding. Incidentally, the bank's fear of the reaction of interested parties to its showing indebtedness on its books, especially for a considerable period of time, is sometimes referred to as an aspect of the "tradition against borrowing;" but to speak of this as "tradition" is to use that term too loosely. In this sense of the word, one stops for a red traffic signal because of "tradition!" The more meaningful usage (see below) would limit it to those determinants of borrowing that are rooted in custom or ethics as opposed to factors, such as the one presently under discussion, having an economic or legal basis.

Some writers suggest that reluctance to borrow is partly due to fear that some depositors may regard it as an evil omen if the bank shows a "Bills Payable and Rediscounts" item in its Statement, since this usually involves the pledge of some of the best assets, leaving less for the depositors in case of liquiditation.[1]

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[1] Whittlesey, Bank Liquidity and the War., p. 62; and U.S. Congress, Joint Committee on the Economic Report, op. cit. I, p. 392.

Also feared is the possible reaction of the lender and regulatory authority. In pre-Federal Reserve days:

> The ability /of a bank/ to borrow when occasion arose depended upon the maintenance of a good credit line with correspondent banks. Interbank relations were very close and the success or failure of a bank in a time of crisis might depend upon the support it received from correspondent banks. Continuous borrowing was looked upon as a reflection upon the liquidity of the bank.[1]

This attitude toward long-duration borrowing has been carried into the Federal Reserve era, not simply as tradition but as a practice which makes for safer banking. Thus the Federal Reserve has always pursued a policy of, on the one hand, continuing to discourage the practice of a bank's being continuously in debt to it and of, on the other hand, encouraging the moderate use of its lending facilities for the benefit of agriculture, commerce, and industry.

Tradition

A fourth influence on borrowing is the so-called "tradition against borrowing," which is set forth especially as an explanation of the failure of banks to borrow whenever there is a spread between rediscount and lending rates. To the extent that the spread is not really sufficient, considering all costs, to yield any net return, and to the extent that the bank fails to borrow because of fear of reaction, the tradition explanation is not really applicable. Also, in so far as "the inherent strength of this attitude /toward borrow-

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[1] Turner, op. cit., p. 76.

ing7 is to a considerable extent based on the actual results of successful bank operation,"[1] the term "tradition" again is not appropriate, since holding otherwise would amount to calling any tested business policy "tradition" - surely an overextension of the term. Actually, there is a distinction - difficult to ascertain in practice - between policy and tradition. The distinction seems to lie in whether there is periodic reassessment of the matter involved and an open-minded attitude toward change. A policy of refraining from borrowing except under specified circumstances is thus distinguished, albeit not sharply, from a tradition against borrowing, if the existing attitude toward borrowing is regularly scrutinized as to its suitability to current conditions. Perhaps the role of tradition in this connection is best described as a force limiting the amount of borrowing, but itself subject to the influence of economic and other factors, cyclically and secularly. Tradition against borrowing is thus placed in proper perspective, alongside such other phenomena as "traditional" classes of bank assets, "traditional" banking hours, "traditional" capital ratios, etc., practices which have a status that almost seems to transcend change, but yet do change - sometimes rapidly and considerably - when pressures are great enough to overcome the resistances to change.[2]

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[1] Riefler, op. cit., p. 30.

[2] Turner, op. cit., p. 89. Cf. also Boulding, Reconstruction of Economics, pp. 37-38.

There is some reason to believe that the "tradition against borrowing" may be losing its influence. Before World War II, Turner saw several factors making for a gradual weakening of tradition: (1) the partial transfer of reserves from correspondent banks to Reserve Banks. In contrast to correspondent relations which "were delicate bonds, carefully nourished and cautiously guarded,../member/ banks feel that, if they present the right kind of paper, the Reserve banks are obliged to lend to them.../The/ circumstances would be unusual indeed in which a Reserve bank would fail to comply with the request of a member."[1] (2) The changed technique of borrowing, which has caused this type of transaction to become impersonal:

> It is the practice of many member banks to keep deposited with the Reserve bank an amount of collateral sufficient to cover all ordinary contingencies, and a supply of signed note forms. Then, if it is desired to "adjust reserves," all that is required is a telephone message to the Reserve bank instructing them to fill in one of the blank notes for a certain amount, and to hypothecate an amount of collateral sufficient to cover the note.... /(3)/ A subtle but very real change in business and banking ethics...most perceptible during the decade of the twenties but ...operating for an indefinite period of time...concomitant with the growth in size of financial institutions, and of the impersonalization of an increasing proportion of business relationships....without attempting specific definition, it is suggested that this change has weakened the tradition against borrowing - a tradition based upon conformance to customary tenets of good business, regardless of money profits.[2]

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[1] Turner, op. cit., p. 77.

[2] ibid., pp. 78-79.

Wallich, writing more recently, also sees signs of the decline of this tradition, giving these reasons:

> The changed climate of business and banking and the growing custom of borrowing in itself may be relaxing the discipline. Besides, window dressing on statement day is often possible through overborrowing and averaging of daily reserve figures. It is said by some observers that the reluctance of many banks is beginning to wear thin.[1]

Lack of Information

One additional factor influencing borrowing should be mentioned to complete this discussion: lack of information on the part of some bankers of opportunities available in the money market.[2]

The Capital-to-Assets Ratio

In this section, an attempt is made to examine the capital/assets ratio problem from the standpoint of the individual bank management, noting the factors which determine the bank's preferred capital/assets ratio and the means whereby the bank can influence this ratio.

Asset-Mix

One major determinant of the preferred capital/assets ratio is the asset-mix. It will be recalled that in Part II the various characteristics of the asset-mix were discussed under the headings of interest rates, risk, and cost. De-

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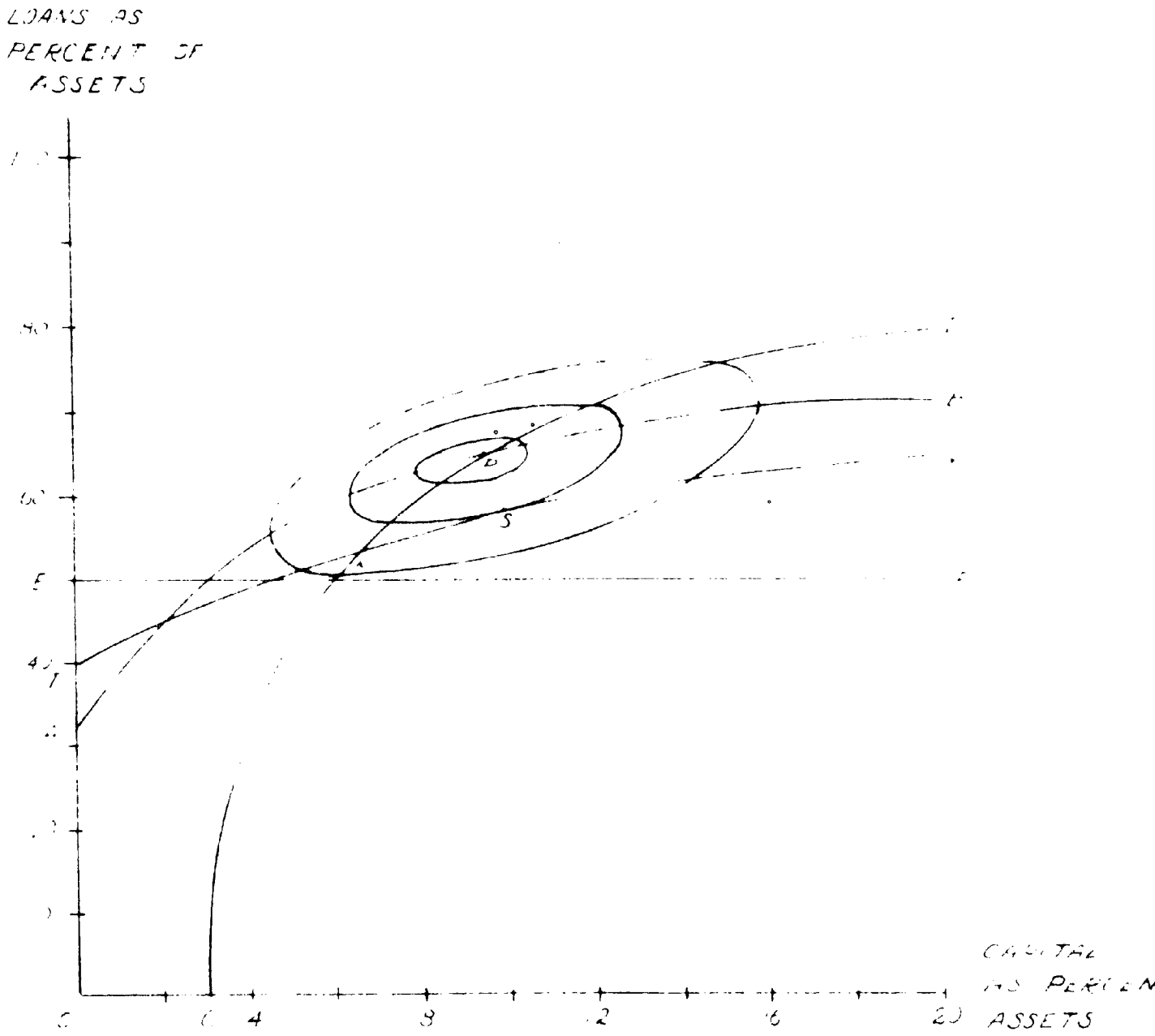
[1] Wallich, AER (Papers and Proceedings), XLIII (May, 1953), p. 34.

[2] Turner, op. cit., pp. 80, 155.

tailed treatment of these matters there renders unnecessary any extended comment in this chapter. One point might profit from some additional elaboration, however: the mutual determination of the preferred asset-mix and preferred capital-to-assets ratio.

To illustrate this mutual determination, Figure 7 is constructed. Points on the vertical axis refer to loans/assets ratios ranging from zero to 100 percent. In similar manner, capital/assets ratios from zero to 20 percent are represented on the horizontal axis. Several indifference curves are drawn to represent a preference surface, the highest point on which is at P. The assumption underlying the shape of this surface is that, for both the loan ratio and the capital ratio, after a certain point further increases will diminish total utility. The reason is obvious in the case of loans: risk considerations. The reason in the case of the capital ratio has to do with the cost of increasing capital and the "opportunity cost" of maintaining existing capital, matters that will be discussed shortly.

Curve CD represents the preferred capital/assets ratio at various given loans/assets ratios. This curve is the locus of points, each one of which is a point of tangency of an indifference curve and a line perpendicular to the Y axis. One such line is EF. Each point on EF describes a different K/A ratio but the same L/A ratio. Starting at E, the line crosses successively higher indifference curves until it becomes tangent to an indifference


LOANS AS
PERCENT OF
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8
12
16
20
ASSETS

curve at R, after which it crosses successively lower-valued indifference curves. Point R clearly is the optimum K/A ratio, given loans/assets ratio E. The same reasoning applies to all other points on CD. The shape of this curve embodies the plausible and generally-accepted assumption that as the loans/assets ratio rises, the desired capital/assets ratio also rises, and at an increasing rate, reflecting the increasing pressure of liquidity and safety needs.

Curve AB, analogously, is the locus of points each one of which is situated at the tangency-point of an indifference curve and a line perpendicular to the X axis and represents the optimum L/A ratios appropriate to various given K/A ratios. The shape of AB represents the assumption that an increase in the K/A ratio carries with it the desire for a higher L/A ratio but that this desire weakens at successively higher capital ratios due to increasing marginal risks incurred in connection with a larger loan account relative to total assets.[1]

These two curves, CD and AB, intersect at point P, of course, which is the preferred position: and the bank may be expected to move toward this position unless subject to constraints with respect to its loans/assets or capital/assets position, so long as the preference structure itself remains

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[1]One possible alternative, riskier assets, cannot be depicted on this diagram. However, government supervision of bank assets and banking's own mores usually preclude their acquiring assets of substantially greater risk, so this alternative is not of great practical importance.

unchanged. One such constraint is limited demand for loan accommodation. Curve TV might exemplify this constraint. The bank is effectively limited in its lending by the imperfections in the loan market so that, to increase its lending, it may have to engage in practices ethically or economically unacceptable to it. The shape of TV recognizes an additional constraint which may be illustrated by the so-called "ten percent rule" for national banks. It is assumed here that the larger is the bank's total capital, the larger its loan account can be because fewer loans are forbidden on grounds of their size relative to bank capital and surplus. The ability of the bank to lend, in other words, depends not only on demand for accommodation but also on its capital ratio. The shape of curve TV depends on the potential of large loan customers available to the bank. A bank whose clientele consists mainly of borrowers which are small relative to the bank's own size would show a TV curve which is flat over a good share of its range. At the other extreme, a bank may feel itself severely straitened by lack of capital in view of a substantial potential demand for loans of large amounts. The shape of TV in the latter case would be described as rising steeply upward and to the right.[1]

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[1]One method of qualifying to lend larger amounts to one borrower is illustrated in the experience of Continental National Bank and Trust Company of Salt Lake City, Utah, which was converted into a state bank to enable it to lend up to 15 percent of its capital and surplus to one borrower. This action, in effect, moved the entire TV line upward. See "Bank Shuffle," Business Week, January 19, 1952, p. 150.

Note that, as drawn here, loan demand and the legal limitations relating capital to outstanding loans to individual borrowers impose no constraint at very low capital ratios, i.e., those to the left of point N, it being assumed that the bank is desirous of assuming a very low-risk position due to its thin capital ratio and so refuses certain loan requests on "portfolio balance" grounds.[1] In general, however, the effects of these two constraints is to prevent the attainment of point P; the preferred position now is point S, where curve TV is tangent to an indifference curve.

Although point P is considered the optimum combination of the two ratios, L/E and K/A, there seem to be circumstances under which the bank will voluntarily, though perhaps not without misgivings, deviate from the position for reasons which transcend mere size of ratios. One thinks, for example, of situations such as that faced by many banks during much of the period following world war II: strong demand for loan accommodation by old established customers and desirable new ones. As we observed earlier, the bank may then go out on a limb, so to speak, because of long-run considerations, hoping and attempting to regain a safer position later. In terms of Figure 7, the bank locates itself somewhere above curve AB, probably to the left of P, hoping to increase its capital and/or eventually reduce its loan account to a safer position. As another example,

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[1] cf. Supra; also Robinson, Management of Bank Funds, pp. 86-87.

the case of a newly-established bank may be mentioned. The capital/assets ratio is almost bound to be higher than equilibrium, and E/A lower than equilibrium; but the bank hopes to increase loans and deposits, thus moving the actual position up and to the left, toward point P.

Of course, the loans/assets ratio merely represents the asset structure; but the conclusions reached can be broadened to take in the whole structure: other things being equal, a higher capital ratio may be expected to cause the bank to desire a less liquid, more risky asset position, while a lower ratio will tend to have opposite effects.

Costs of Maintaining Bank Capital

Countering various pressures for increasing bank capital relative to assets are certain hard facts that, added up, mean cost to owners of keeping their own assets in the form of shares of ownership in a bank. Consider the fact that, at the margin, the shareholder's dollar is probably earning less than two percent gross for the bank, the net being inevitably less. This being so, it is no wonder that there is reluctance at times to increase ownership equity in the bank. As Robinson put it:

> The only way in which additional capital can contribute materially to increased earnings would be by influencing lending or investing policy. If a bank with added capital felt more free to pursue a liberal lending policy or to broaden, perhaps lengthen, security portfolios, some increase in earnings would result. This increase, however, would be a gross increase, not a net increase; the risk costs of such a program are indeterminate but often material. The net result might be pretty small. And,

> what is perhaps more important, many banks are so settled in their general asset management policies that changes of the sort outlined here cannot come quickly; in fact, they may never appear.[1]

There is thus a source of continuing pressure on management to limit capital to the amount at which marginal return to capital invested in the bank is comparable to that in other uses.[2]

Another, and a related, type of cost of capital maintenance is consumption foregone. The investors may put pressure on management to declare larger dividends because of desire to realize income to be used for consumption purposes.

The problem of management with regard to dividend policy is neatly summarized by Shaw as follows:

> Business dividend payments...exhaust net resources. The alternative to them is saving. Somewhat as consumers may express a preference for consumption now over saving and put it in terms of a marginal rate of return on present consumption, so boards of directors may calculate the advantages of keeping stockholders content by splitting dividend melons. Some small rate of dividends is worth while if only to fend off a stockholder vote for liquidation. Some high rate is dangerous, because it would cripple the operating capacity of the corporation. In between these two extremes are levels of dividend payments that may be judged roughly in terms of marginal

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[1] Robinson, HBR, XXVI (August, 1948), pp. 400-401.

[2] A complication arises from the fact of the cost of transfer of the form of assets in terms of time and effort of the investor and, perhaps more important, of tax liability incurred when capital is withdrawn in dividends. The returns - in dollars - from the prospective other use(s), considering the depletion of the investment fund, must be greater than the present return to justify a transfer.

returns. Directors have to balance the options of keeping resources in the firm or of paying them out for the personal use of stockholders.[1]

Of a more tangible nature is another type of cost: the tax on bank shares, which is levied in most states. The base of this tax is generally the full par value of the shares or the full value of the capital, surplus, and undivided profit of the bank.[2] Where the entire capital of the bank if subject to this tax, it is clear that the marginal profit of additions to capital from retained earnings will be less by reason of the shares tax; and plowing back of earnings is discouraged to that extent. Sensing this, some states permit deductions from the tax base of part or all of surplus.[3] Evidence of the effects of the shares tax on bank capital accumulation is offered by Kimmel, who found that, in general, banks in states levying a bank shares tax had lower capital/deposits ratios than banks in states with different forms of bank taxation.[4] Reviewing the pre-1933 experience of the banking system, he concluded that "the taxation of capital funds at high rates in the western and

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[1] Shaw, Money, Income, and Monetary Policy, p. 291. Also Robinson, Management of Bank Funds, pp. 413-416.

[2] Schultz, op. cit., pp. 460-461.

[3] ibid.

[4] Kimmel, op. cit., p. 116.

southern states...was unquestionably a factor contributing to under-capitalization."[1]

Obstacles to Attracting Outside Capital

There are situations, such as a rapid growth in bank assets and deposits, in which additions to the bank's capital through a stock issue may seem to be indicated. Beside the deterrents to additional capital discussed in the foregoing section in connection with plowing back of earnings - possible low marginal returns and, where a shares tax exists, generally an increase in tax liabilities - both of which are also relevant here, there are additional obstacles applicable to acquisition of capital through a stock issue.[2] First, unlike other businesses, the increase in bank debt (deposits) imposes very little additional fixed expenses, thus making acquisition of assets through debt less unattractive. Second, bank stock lacks appeal to most investors due to generally conservative dividend policies and a lack of possibility of reaping really large returns.[3] And finally, in the case of banks that are closely held, the present owners will be

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[1] ibid., p. 126.

[2] This section owes much to Smith and Hengren, op. cit., pp. 554-555.

[3] The rise of institutional funds is alleviating this situation as these organizations have increased and diversified their holdings of bank stocks. Liberalization of savings bank portfolio legislation also has broadened the market for bank stocks. See M. A. Schapire, "Shifts in Bank Deposits: 1940-1953," Commercial and Financial Chronicle, CLXXIX (February 18, 1954), p. 786.

reluctant to jeopardize their position of control through sale of stock to outsiders.

Government Influence

The rationale of government obtrusion into the matter of bank capital is thus expressed by Shaw:

> Over a century of experience has convinced both federal and state governments that compulsory measures are necessary to obtain even modestly adequate capitalization for commercial banks. The temptation to thin net worth down to the minimum in order to maximize the ratio of earnings and dividends to stockholders' equities has been too strong for the government to ignore or tolerate.[1]

In practice, though, the government has been extremely lenient in regard to bank capital ratios. Legislation generally stipulates minimum amounts of capital but not the relationship of bank capital to other magnitudes. This latter, however, is not ignored but is, in effect entrusted to administrative agencies. The FDIC, for instance, is charged with making sure that insured nonmember bank capital is "adequate."[2] And the Federal Reserve Board of Governors is empowered to police the capital ratios of member banks. A recent case[3] confirmed the power of the Board to hold hearings on whether a state member bank has adequate capital

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[1]Shaw, Money, Income, and Monetary Policy, p. 111.

[2]Federal Deposit Insurance Corporation, Annual Report, 1945 (Washington: Government Printing Office, 1946), p. 28.

[3]The Continental Bank and Trust Company vs. Emery J. Woodall, 239 F (2d.) 707. See Federal Reserve Bulletin, January, 1957, pp. 22-23 for full text of the opinion of the Court of Appeals and ibid., May, 1957, p. 521, for final disposition by the Supreme Court of the United States. Note that this is the same bank as referred to in footnote , p. .

funds and, if these were found deficient, to order it to repair the deficiency under penalty of forfeiture of membership in the system.

For two or three decades prior to 1940, a capital-to-deposits ratio of one to ten had considerable influence both in state and in Federal banking supervision circles.[1] However, the enormous increase in bank deposits and the fundamental change in the character of bank assets that took place during World War II undermined the influence of this rule of thumb. Although no generally accepted criterion has evolved by which adequacy of capital can be judged, the regulatory agencies nevertheless are capable of applying pressure on individual banks, and on banks under their jurisdiction generally, to increase capitalization.

When the capital ratio set up by government is of an absolute nature, the effect is to impose a constraint on the bank's liability-mix. In terms of Figure 7, the bank is barred from any position lying to the left of a vertical line all points on which represent the required capital ratio specified and various loans/assets ratios. If this line is located left of point P, no effective constraint results, but if to the right, the bank would choose a higher loan ratio in order partially to compensate for the loss of

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[1]Robinson, "The Capital-Deposit Ratio in Banking Supervision," JPE XLIX (February, 1941), pp. 42-44.

utility brought about by the higher-than-equilibrium capital ratio. When the government does not impose a ratio minimum but rather puts pressure on the bank to increase capital, the result is represented as a shift of the preference structure in which point P moves rightward and probably upward as well. Undoubtedly, too, the height of P, i.e., the utility it represents, is greater than before.

Once again, attention is called to the symbolic nature of the above diagram. A movement toward a higher loan ratio depicted on this diagram is understood as a movement toward a generally higher-risk position; while, in similar fashion, a lower loan ratio connotes a lower-risk position.

Other Determinants of the Capital/assets Ratio

Several other possible influences on the preferred capital ratio may be briefly touched upon: dividend maintenance, bank size, form of organization (branch vs. unit), and management personalities.

Dividend maintenance is considered important by the individual bank as a means of maintaining public confidence in its economic soundness. As evidence, consider the fact that when state member banks were suffering substantial deficits from 1932 to 1934, their dividend payments were larger during each of those years than they were in 1935 and 1936 when these banks were showing a profit.[1]

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[1]Poston, op. cit., pp. 86-88.

In order to be in a position to pay dividends during lean years, a bank will want to accumulate a fund of capital during prosperous periods. Thus, even though additions to capital out of earnings in good times may be expected to yield a low - or even negative - marginal rate of profit in the short-run sense, the desirability of additional capital may still be strong due to dividend maintanance considerations.

An inverse relationship between bank size and capital is clearly indicated in published Federal Reserve and FDIC data.[1] Ryan suggests a reason for this:

> Though the composition of the assets does not indicate any marked degree of variation in the various [bank size] groups, the smaller banks do rely to a greater degree on loans and discounts than the larger banks, and a considerably larger percentage of such loans fall into the substandard classification.[2]

Comparing the capital/assets ratios of branch banks and unit banks in California, Martin found that the median ratio for unit banks was 6.5 percent; for multiple-outlet banks, 5.6 percent. Because of the small number of unit banks, the difference was not considered statistically significant; but Martin felt that some such differential was to be expected, since multiple-outlet banks can gain more

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[1] See, for example, Federal Reserve Bulletin, June, 1957, p. 720.

[2] Ryan, op. cit., p. 233.

diversification in their loan accounts, hence need less capital relative to assets, than large unit banks.[1]

Although Martin does not draw any such inference, his data on comparative growth rates of the two forms of bank organization in California suggest a possible reason for the somewhat lower average capital ratio of branch systems as compared with that of unit banks. Between 1920 and 1950, total assets of branch systems grew 897.4 percent, those of unit banks by 259.2 percent.[2] Inasmuch as capital growth tends to lag behind asset growth when the latter is substantial, it is reasonable to consider this factor as at least partially responsible for the difference in capital ratios.

The influence of management personalities on preferred capital ratios is difficult to isolate, although one would hardly deny its existence. Martin holds that this factor is more influential than organization-form in explaining differentials, but his reasoning apparently is based solely on the premise that no other explanation seems adequate.[3] A firm conclusion demands positive evidence, however; and this is not available.

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[1] Martin, op. cit., pp. 120-122.

[2] ibid, p. 30.

[3] ibid., p. 121.

The Capital-Mix

Bankers are not indifferent as to the structure of their capital accounts. Both economic and legal factors work against the neglect of this matter, as a brief discussion of these factors will indicate.

The first such factor is exemplified by the well-known "ten-percent rule," applying to national banks, and its counterparts in various states. This rule states that a national bank may not lend to any individual borrower (with specified classes of exceptions) more than an amount equal to ten percent of its (the bank's) capital stock and surplus. In so far as there exists the opportunity of lending larger amounts to certain borrowers than the bank can presently handle on the basis of its capital stock and surplus, and in so far as the bank's current volume and/or mix of loans is less desirable than it would be with some of these larger customers, the bank is to that extent under pressure to increase the share of its capital consisting of capital stock and surplus.

Secondly, national banks are subject to the requirement that they must add to their surplus account semiannually ten percent of their net earnings, before deductions for dividends, until surplus is equal in amount to the capital stock.[1]

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[1] Some states have similar requirements. See Kent, op. cit., p. 165, n. 3.

This is a factor influencing not only the capital-mix but also the capital ratio, since dividends are, in effect, limited to 90 percent of earnings for national banks whose surplus is less than their capital stock.

The third influence, public and banker attitude toward various capital accounts, was discussed in Chapter VII. The gist of the matter is that banks are restrained from increasing their capital stock and surplus accounts - and perhaps even the undivided profits account - because of fear of public reaction to declines in these accounts resulting from reductions in earning-asset values. Banks are thus induced to try to hide losses by using various reserve accounts.

One final influence merits mention. Newly-organized national banks must have a paid-in surplus equal to at least 20 percent of the capital stock account.

CHAPTER XI

SIZE-PREFERENCE

There is another dimension involved in the equilibrium position of a firm. Perhaps it is best expressed simply as "size," meaning the total recorded value of the firm's assets and, by the same token, liabilities.[1] Similar to this dimension in the conventional theory of the firm is scale, as distinguished from proportion. In this terminology, the firm is thought of as attempting, through substitution among various types of inputs, to equate the ratio of marginal revenue product of each factor input to its marginal cost. Similarly, we have heretofore been discussing the adjustments among classes of assets and liabilities which the bank undertakes in its striving for an optimum combination. However, this equality among ratios is not a sufficient condition for equilibrium of the firm in conventional analysis: there is also the scale problem, i.e., the problem of equating the marginal revenue products with their respective marginal input costs. In analogous terminology, so long as the bank anticipates an increase in utility through simultaneously increasing (or decreasing) its total of assets and liabilities, it is not presently in equilibrium in any meaningful sense, no matter how nicely its asset (and liability) categories are adjusted with respect to each other. And just as proportionality and scale

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[1] Federal Reserve data use deposits as the measure of size; but no great confusion should result from this difference in base since the deposits/assets ratio does not vary substantially with size, except for the smallest banks.

are interrelated,[1] so are preferred asset- and liability-mix and preferred size.[2]

In this chapter, then, emphasis will be on the determinants of the equilibrium, or preferred, size of the bank; but throughout the discussion the interdependence of size and balance-sheet composition will be pointed up.

Means of Changing Bank Size

Before getting on to the determinants, it is worth while to note briefly the means by which the bank can change its own size. Some actions by the bank, although primarily used in order to effect asset- or liability-mix adjustments, have the more or less incidental result of affecting the size of the bank. Among these devices are actions to change the amount of the bank's capital and of its borrowings. The first of these, changing total capital, is accomplished by a number of means - declaring dividends, retaining earnings, and selling stock, and the opposites of these three - as discussed in Chapter X. The increasing of bank capital is not designed to in-

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[1] Edward H. Chamberlin, "Proportionality, divisibility and Economies of Scale," QJE, LXII (February, 1948), pp. 229-262.

[2] Statistical data of the Federal Reserve and Federal Deposit Insurance Corporation relating bank size and asset structure are suggestive of preferences, but it must be remembered that many characteristics vary with size - such as type of location, loan-mix, and size-mix of loans - so that it is not possible to isolate the effect of size alone. Furthermore, we are dealing here with preferences; the published figures do not necessarily correspond with preferences, although comparison between sets of data at two points of time might serve as prima facie evidence as to the relation between preferred and actual positions as of the first point of time.

crease bank size directly. It is rather, as we saw, to make management feel more comfortable in the face of increased risk assets or to satisfy statutory or regulatory requirements. Of course, if it is anticipated that such an increase will attract additional deposits because of "sounder" condition or because of ability to attract big borrower-depositors or, negatively, will deter depositors from removing their funds, the size-factor may play a more than incidental role in a decision of this type.

The use of borrowed funds, especially from the Fed, is hardly of importance as a means of changing bank size, being overshadowed by their use for asset-mix purposes, i.e., to overcome an actual reserve deficiency or to enable the bank to make certain loans that it otherwise could not make if such supplementary funds were unavailable to meet a reserve deficiency.

Changes in the amount of a bank's deposits generally involve changes in its size. Seldom can a bank gain deposits simply by wishing or by permitting applicants to make deposits. Of course, deposits may increase as a result of external forces, the bank playing an essentially passive role; but a bank that wants to acquire additional deposits must generally incur costs in the form of an increase in deposit interest rates or sales promotion expenses or both, which may or may not be well-advised, depending on the responsiveness of deposits to these devices and the likelihood of retaliation. Further discussion of this matter will be presented below.

Another means that may be available to the bank for altering its size is changing the amount of its loans. From the standpoint of the individual bank, the proceeds of a loan may be expected to be withdrawn shortly (except for compensatory balances, if such are customary), according to the accepted doctrine. However, since borrowers are likely also to be depositors, an increase in bank lending will normally be associated with an increase in the bank's average annual deposits, cet. par., in an amount larger than the minimum required balance (if any) since most borrowers are likely to accumulate deposit balances over the course of the year, if only in preparation for repaying all or part of the loans. No answer will be attempted at this point to the question whether in adopting a policy of encouraging new loan accounts the bank is thinking in terms primarily of its size or of its portfolio, but it seems highly probable that both play a part in such decisions.

Banks can influence their own size to some extent by the degree to which they maintain and enforce a requirement that the borrower keep a minimum or average balance on deposit equal to some specified percentage of the loan(s) outstanding or of the line of credit. The extent to which this requirement is used varies considerably, but it is most widely main- in cities, as opposed to country districts, and most often enforced in times of credit stringency.[1]

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[1]Robinson, Management of Bank Funds, p. 106.

A recent survey by the Federal Reserve sheds some light on the extent of use of this device, although it is well to observe its author's admonition that the use of such requirements varies over time and with business conditions.[1] It was found that, of the 2,000 banks in the Survey of Member Bank Loans for Commercial and Industrial Purposes, October, 1955, approximately one-quarter imposed a requirement of a minimum deposit balance applying to at least some of the business borrowers. The percent required was most frequently from 16 to 20.[2]

When imposed in periods such as the early 'thirties, the purpose is mainly concerned with asset composition, viz., maintenance of liquidity at least momentarily by limiting depletion of reserves. When used during periods of high demand for loans, on the other hand, the purpose is at least in part to increase the size of the earning-asset base as a means, alternative to raising interest rates, of increasing income. Indirect evidence of this latter point is the fact that, according to the Federal Reserve survey cited above, "a number of banks which had no [minimum balance] requirements indicated that they take the customer's deposit balance into account in setting interest rates on loans.[3]

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[1] Caroline H. Cagle, "Credit Lines and Minimum Balance Requirements," Federal Reserve Bulletin, June, 1956, p. 573.

[2] ibid., p. 578.

[3] ibid., p. 576.

Also worth noting is the fact that an increase in the amount of a loan induced by the minimum balance requirement is not accompanied by a corresponding increase in risk since the borrower maintains a larger deposit balance than he otherwise would.

In using any of the above devices, the main purpose may or may not be to change the size of the bank. However, the final device, the merger,[1] can hardly be conceived of as having any primary immediate purpose other than to increase the size of the bank and gain the advantages associated therewith, including more "outlets." The merger may, and nowadays usually does, concern bank firms only; but in the past there were many such moves that joined a bank with a trust company, a fiduciary business, or a securities business.[2]

Determinants of Preferred Size

The utility of each asset position, we have said, depends primarily on the cost, gross yield, and risk associated therewith. By showing these three factors functionally related to size of bank, we are prepared to incorporate size into our model of the bank firm. In this section, then, size of bank will be discussed primarily in terms of its effects on cost,

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[1]The term "merger" is used herein to describe any process that results in the combining of two or more banks into a single firm, whether or not the identity of any of the component banks is preserved. This usage seems to be customary in the financial press, although technically a merger is only one of several types of combination. See any business finance text for discussion of these various types.

[2]The Banking Situation, pp. 47-48.

interest income, and risk.

Size and Cost

Banks are usually regarded as operating within the range in which the "long-run average cost" curve is declining; that is, the larger the bank, the lower the ratio of operating costs to total assets. This relationship between costs and size is brought out clearly in Table 7. Considering that the class widths grow progressively larger with size, it is evident that a rather sharp drop in cost ratios occurs within a relatively narrow size range at the small end of the scale and that a levelling-off characterizes the cost ratios in the middle ranges. Then the rate of decline increases again for the largest classes of banks.

TABLE 7

COST RATIOS, BY SIZE OF BANK, 1955*

Cost Components, As Percent of Assets	Size Group: Total Deposits (in $ millions)								
	Total	Less Than 2	2-5	5-10	10-25	25-50	50-100	100-500	500 or More
Total	1.80	2.20	2.07	2.07	2.11	2.02	1.97	1.82	1.58
Wages & Salaries	.88	1.17	1.04	1.00	1.01	.97	.95	.89	.78
Other expenses	.92	1.03	1.03	1.07	1.10	1.05	1.02	.93	.80

*Note: Assets and deposit figures are as of the end of the year
Source: Derived from data in Federal Reserve Bulletin, May, 1956, p. 514.

Larger banks have lower average costs, according to Alhadeff, primarily because of (1) larger average loan size, (2) smaller fraction of earning assets in high-cost types of

loans, (3) specialization of labor, (4) lower ratio of time deposits to loans and investments, and (5) lower average fixed costs.[1] Perhaps Alhadeff should have added a sixth - lower ratio of capital to assets, since the cost of the capital accounts is obviously less than that associated with deposits, per dollar, due to both handling and interest expense involved in the latter category.

Reason 3 and perhaps 5 in Alhadeff's list appear to be directly related to the scale of the firm, but the other three reasons are concerned with the type of "output" (1 and 2) and "input" (4), with the added sixth also being a matter of inputs in this sense. When the economist compares costs of different-sized firms in an industry, he must assume units of output which are identical or nearly so. Otherwise, nothing can be said concerning the relative efficiency of firms of different sizes. What is needed at this point, therefore, are data covering banks of different sizes but alike in all other relevant respects, in order that the effects of the size-factor alone might be ascertained.

The method used in a National Bureau study by Dauer overcomes in part this difficulty of relating the size-variable with costs which is caused by the co-variation of other factors with size. Dauer found that:

> Except among the smallest banks - those with deposits of $500,0000 or less - the cost rates [operating costs/earning assets] declined only slightly and irregularly among banks with approximately the same loan-income rate [interest from loans/loans] as size of bank increased.
>
> But irrespective of size, the cost rates shown by banks with similar loan proportions [loans/assets] exhibited a

decided tendency to rise as loan-income rate increased.[1] In other words, it is the size- and type-distribution of loans, as reflected in the loan-income rate, and the loans/assets ratio, rather than the size of the bank as such, which primarily determine differentials in average cost.

Seeing that average costs of banking vary inversely with size, we are led to inquire next into the problem of what happens to the individual bank as it changes size. Does it simply coast down Alhadeff's long-run average cost curve as it grows? In large part, the answer depends on the means through which the growth occurs, i.e., whether through passive acceptance of new deposits or through actively seeking them.

The bank may experience growth, in the first place, by passively accepting new deposits. It would be a mistake to consider this as a "costless" means of increasing size, but it does certainly involve lower additions to cost per dollar of marginal deposits than the alternative methods of advertising and increasing deposit interest rates, to be discussed below. The passive route to growth should enable the bank to coast down the "average cost curve" (as this term was used above) in time, as the economies available to larger banks due to larger, lower-cost earning assets, more extensive division of labor, etc., are realized by the bank in question.

For most banks most of the time, however, the barrier to increasing size appears to be the imperfect market for

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[1] Dauer, op. cit., p. 124.

the bank's chief raw material: money-service purchased from depositors, which will be called simply "deposits," although the flow aspect is being stressed here. When the bank has no excess reserves, it cannot simply buy additional deposits at the going rate of interest, varying the amount purchased per unit of time by the marginal revenue (allowing, somehow, for risk) from the sale of such services to users of funds. Rather, higher deposit interest rates must be paid, or promotional expense incurred, to attract deposits, with consequent substantial rise in the marginal cost curve.

Whether or not raising the interest rate on time deposits in a given situation would be wise depends, in part, on their elasticity of supply, a matter which has received some attention in banking literature. Chandler lists the following as determinants of elasticity of deposit supply: (1) the degree of superiority of the bank's prestige and location; (2) the number and kinds of competitors, bank and nonbank; and (3) the size-mix of its deposits. Clearly, the greater the superiority of prestige and location and the fewer and less closely competing are its rivals, the lower will be the elasticity of supply. The size-mix of deposits is positively related to supply elasticity since large depositors (1) have more at stake, hence are inclined to be more responsive to interest changes, (2) usually have better knowledge of alternative outlets; (3) are more likely to maintain relations with more than one bank; and (4) are less likely to be under pressure to maintain a deposit with a given bank in order to

qualify for a loan there.[1]

Turning from the general to the more specific, we examine first the experience of banks during the Great depression, as seen by Robinson:

> During the 1930's, many banks felt they should reduce interest rates on savings accounts, but feared to do so because of outraged depositor withdrawals. Some who did cut rates went to pains to be unusually liquid at the time they took the action.
>
> Nearly always this was an unnecessary precaution. Depositors seemed almost indifferent to interest rates. When the cut came, they did nothing. There were cases where neighboring banks had different rates and there seemed to be almost no evident shift from the low-rate to the higher rate bank. There were even banks which cut out interest payments altogether without losing too large a proportion of their deposits. Some banks asked their depositors to take the money away, and the request was not heeded.[2]

In contrast to the above situation, Robinson calls attention to certain postwar events bearing on the question of elasticity of deposit supply. In 1948, mutual savings banks raised their dividend rates from (usually) a one and one-half percent level to two percent while Eastern commercial banks generally held the line at one percent. Robinson describes the results thus:

> The differential of a full percentage point did make a great deal of competitive difference. In that year [1948] and afterward, the mutuals took business away from the commercial banks and gained savings deposits while the commercial-bank departments were losing them. Some commercial-bank rates were subsequently raised.[3]

A study of mutual savings banks by John Lintner for the

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[1] Chandler, op. cit., p. 4.

[2] Robinson, Management of Bank Funds, p. 344.

[3] ibid., p. 345.

most part corroborates Robinson's observations of the post-war experience of banks but casts some doubt on his statements concerning the Great Depression, at least as these are applied to mutual savings banks. Lintner's procedures and the results are indicated in the following quotations from this study:

> Our study clearly indicates...that it is a mistake to conclude that the rate of interest offered to depositors has lost its effect on the relative rates of growth of different depositories. The records of the Savings Banks Association of Massachusetts contain quarterly reports of the deposit liabilities of each bank in the state running back to January, 1929, and the Annual Reports of the Commissioner of Banks show the dividend rates of each bank in the state at every dividend date. Now, if the dividend rates in fact have no effect (or at most a negligible effect) on people's decisions where they place their savings, the relative growth of two savings banks, A and B, located near each other in the same community, should not be significantly affected if one changes its dividend rate while the other does not.
>
> There were 58 cases in which one of two near-by banks, which had previously been paying the same rates of dividend, dropped its rate while the other maintained its previous rate. In 41 of these cases this comparison of the movement of deposits indicated that the change in dividend rate had had a substantial effect, increasing the relative flow of deposits to the bank maintaining its rate...Three cases were doubtful, and 14 indicated that the change in dividend rate had no effect or that its effect was not sufficiently strong to outweigh other factors influencing the volume of increases in deposits.[1]

Lintner then cites the experiences of eight pairs of banks, one bank in each of which raised its rate while the other did not. He summarizes as follows: "In both of these situations... approximately three-fourths of the cases show subsequent relative changes in deposits which would indicate that a significant fraction of savings depositors are 'interest conscious.'"[2]

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[1] Lintner, Mutual Savings Banks, pp. 140-141.

[2] Ibid., p. 141.

With reference to the other one-fourth of the cases: "Our field work indicates that a great majority of these cases are explained entirely on the ground that the bank with the higher rate was refusing to accept the new deposits which its higher rate was attracting, and important special factors are known to have affected several others."[1]

Continual pressure recently on the Federal Reserve Board of Governors and on various state banking agencies to permit higher rates on savings deposits, and the steady upward trend of such rates in recent years strongly indicate that bankers and those in control of other savings depositories believe that the supply of such deposits to individual institutions and classes of institutions in a given locality has substantial interest-elasticity.

This seeming contrast between the behavior of owners of savings deposits during the Great Depression and that following world War II raises a question as to whether the change in interest-consciousness is cyclical or secular. The answer probably is "both." In times of depressed conditions, the dominant factor in placing savings is safety, while in prosperous times this factor probably ranks lower among determinants of where savings will be placed. On the other hand, there is reason to believe that the change in interest-consciousness involves a secular element as well, as suggested in this quotation from E. H. Leete, Deputy Superintendent of Banks of

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[1] ibid., p. 142.

New York State:.

> There was a time when the public was not as rate conscious as it is today. One underlying reason is insurance of shares and deposits, which makes people willing to chase clear to California or the Southwest after higher dividends. This panacea...dulls men's minds to such considerations... as adequacy of net worth, earning power, and managerial ability.[1]

Generalizing, for the individual bank or group of banks in collusion, it is evident that the volume of time deposits responds to changes in deposit interest rates. Since the increase in interest cost must be charged to the marginal deposits, the amount of rise in the marginal cost curve depends on the interest-elasticity of the supply of time deposits which, in turn, depends on economic conditions and may be rising secularly.

The problem of interest elasticity of supply is more knotty in the case of demand deposits. Although banks are barred by law from paying interest on such deposits, the trend toward the use, and increases in the rates, of service charges may suggest the inference that banks believe the elasticity of demand-deposit supply with respect to the individual bank or group of colluding banks to be low. This inference would not be logically correst, however. In the first place, the banks may assume that the small, active deposits - which are the most costly to the bank and which would have to pay the highest average per-item charge under most service charge plans, are in fact the ones the supply of which is most elastic, so that the service charge will rid the banks of many of these "nuisance"

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[1] "Pulling Hot Money," Business Week, September 20, 1952, p. 130.

accounts. Secondly, and more basically, the service charge is not the price for holding demand deposits, of course, but (1) the charge levied on demand deposit activity less (2) an allowance based on average or minimum deposit balance maintained during (usually) the month.

The agreement by which a bank provides checking services in exchange for the use of the depositor's money was, until fairly recently, considered an arrangement the component terms of which were not subject to separate treatment. With the advent and growth of service charges the banks have, in effect, recognized that there are at least two[1] services involved in a demand-deposit arrangement: money-service (which the bank receives) and check-handling service (which the bank performs).[2,3] In the absence of service charges, the bank actually pays to the depositor in "implicit interest" an amount equal to the cost of handling his deposit. The imposition of a schedule of service charges on demand deposit activity thus partakes of the nature of a reduction in the interest rate

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[1] Perhaps three: some banks also levy a charge for each deposit.

[2] Certain so-called "low-cost" checking account arrangements go to the opposite extreme, ignoring the deposit-supply aspect and basing the charge solely on deposit activity, e.g., 10¢ per check.

[3] The question of how these deposits originated - i.e., to what extent they are primary and to what extent secondary - is irrelevant to the topic under discussion. The point is that, by refraining from withdrawing the deposit, the depositholder enables the bank to hold income-earning assets.

paid on most demand deposits[1] in that now the cost of handling checks is considered by the bank to be greater than it is willing to pay for the money-service of the demand deposit balance. This interest aspect is recognized implicitly in the credit allowed against deposit-activity charges on the basis of average or minimum deposit balance.

When service charges are viewed in this way, it is evident that both the interest-elasticity of the supply of demand deposits and the price elasticity of demand for deposit-handling service are involved. A bank or group of banks, wishing to increase size, may attempt to attract additional demand deposits either by raising the quasi-interest "offset" or by reducing the charge per deposit-activity item or both. Only the first of these is a cost matter, however; the other being in the income category.

Beside price competition for deposits, there exists the opportunity to engage in nonprice competitive activities. The scope of these activities is indicated in the following quotation:

> Competition for deposits is keen and takes many forms. Open advertising and solicitation are well known. Various kinds of business connections are exploited, city correspondents try to direct business to their country clients and the favor is sometimes returned. Bank directors are often chosen with some regard for the business they can bring with them.[2]

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[1]Some demand depositors, those with large average or minimum balance, may earn enough in "quasi-interest" to offset completely the deposit activity charge, under most plans.

[2]Robinson, Management of Bank Funds, p. 36.

These methods, too, are not without cost to the bank and generally can be expected to result in higher-than-average costs associated with marginal assets and liabilities. The enormous increase in bank advertising in recent years attests to the belief on the part of banks that deposit supply is responsive to such appeals, however. Even where there are only one or two banks in a locality, the phenomenal growth and aggressive tactics of savings and loan associations often seem to call for strong countermeasures in the form of defensive advertising.

The merger device enables size to be increased without the concomitant incurrence of a substantial rise in marginal costs. However, the merged organization cannot simply coast down the long-run average cost curve; justification for a merger generally must be based on considerations other than immediate cost-saving. The reason is found in the fact that the merged organization has essentially the same clientele and therefore the same size-mix and type-mix of deposits, the same size-mix of loans and investments as the formerly separate component units. As compared to a unit bank of similar size, a branch system composed of several formerly-independent banks will tend to have a smaller average loan size, a higher-cost assortment of loans, a higher loans/assets ratio, a higher time deposits/total deposits ratio, and higher overhead costs.[1] Lower average costs may well be realized eventually, but probably not as low

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[1]Alhadeff, Monopoly and Competition in Banking pp. 97-10

as those enjoyed by a unit bank of comparable size.

Under certain circumstances a bank may desire to decrease in size for reasons of cost, but this situation introduces no new problems. To reduce its size and total costs, the bank can run any of the devices, discussed above, in reverse, i.e., lower deposit interest, reduce its outlays for advertising and the like, or (for branch systems) break up into independent banking firms.

In conclusion, we may generalize about the shape of the curve of the function

$$(5a) \qquad C = C'(A)$$

that it probably rises gradually to a point representing the present volume of assets, then breaks sharply upward due to the cost of acquiring additional assets and deposits.

Size and Interest Income

If banks operate within the range of decreasing long-run average costs, in the sense in which the term was used in the foregoing section, they must also be considered to be subject to "decreasing average interest income." Thus, for member banks in 1956, total earnings (about 85 percent from interest income in recent years[1]) as percent of assets ranged downward from 3.69 for the smallest banks (assets of $1 million or less) to 3.41 for the largest over $100 million).[2] The causes are in part similar to those relating to costs:

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[1] Federal Reserve Bulletin, June, 1957, p. 715.

[2] ibid. p. 720.

larger banks tend to have (1) larger average loan size, which means lower average interest rate, other things being equal;[1] (2) smaller fraction of loans of high-yield types; and (3) generally higher percentage of assets in the form of reserves. An exception to the last item is found in the case of the smallest banks, which tend to have the highest reserve ratios.

The reasons for a higher ratio of reserves to assets in larger banks is not inherent in larger size itself but, again, is due to factors generally associated with larger size. Perhaps the most influential of these are (1) the reserve requirement, which is higher for most larger banks because of their location and membership in the Federal Reserve System, and (2) the time deposits/total deposits ratio, which is generally lower for larger banks with the exception, again, of the smallest banks. If the deposit-mix factor were eliminated, the larger banks would have a reserve ratio quite comparable to that of other sizes of banks, as evidenced by the following data.

TABLE 8

RATIO OF CASH ASSETS TO TOTAL ASSETS, BY SIZE OF BANK AND BY RATIO OF TIME TO TOTAL DEPOSITS, 1956*

Ratio of time to Total Deposits	Total	Size Group - Total Deposits ($000			
		2,000 or Less	2,000-5,000	5,000-25,000	Over 25,000
Under 25 percent	24.8	26.6	24.2	23.7	25.3
25-50 percent	19.1	20.8	19.6	18.5	18.0
50 percent & over	15.9	17.3	16.0	15.2	14.6

*Source: Federal Reserve Bulletin, June, 1957, p. 721.

[1]Richard Youngdahl, "The structure of Interest Rates on Business Loans at Member Banks," Federal Reserve Bulletin, July, 1947, p. 803.

with one exception - in the "under 25 percent" group - the ratio of cash assets to total assets in each time deposit/total deposits group declines as size of bank increases. The reason for this behavior of the reserve ratio within a given time deposits/total deposits class relates mainly to the ability of larger banks to economize in the use of reserves because of better knowledge of investment outlets, nearness to money-market facilities - particularly the federal funds market - and smaller average size of deposit relative to total deposits.[1]

Whether the bank grows via the passive route or by means of competitive effort, price or nonprice, it may be expected that, by and large, the forces which cause a lower interest-income/assets ratio for larger banks will operate to reduce this ratio for the growing bank. However, the bank which grows via the merger route will not be thus affected, at least at first, for the same reasons that will normally cause its costs/assets ratio to deviate from the average figure for unit banks of similar size.

In attempting to describe the curve of the function

$$(4a) \qquad Y = Y'(A)$$

we are guided by the fact that interest income as a percent of assets is not influenced directly by quantity of assets. Rather, in our model, size exerts its influence through factors

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[1] Alhadeff, Monopoly and Competition in Banking, pp. 59-60.

already discussed: reserve ratio (R/A), earning-asset mix (symbolized by E_L/E), as well as interest rates on earning assets (i_L, i_I), which are largely autonomous. So the curve of the above function would be simply a straight line, rising upward and to the right. The location of the Y-intercept is determined by the asset structure and the slope of the line primarily by the level and structure of interest rates.

Size and Risk

Risk is, by its nature, not quantifiable. There is no way of comparing the risk associated with the portfolio of a large bank with that of a small one. There is some reason to believe, however, that the risk involved in a given asset decreases with size of bank. In the first place, appraisal of the asset - the creditor's financial position, present and prospective, and all the other variables involved in credit risk, and the money risk of open-market securities - is likely to be more accurate in larger banks, with the result that the extent of uncertainty is reduced. Second, any loss in value of a given asset will have less unfavorable consequences for a larger bank since the asset is smaller relative to the size of the bank. Given the asset structure, the credit risk of the whole portfolio also should be lower for the larger bank due to readier availability of supplements to reserves. For these reasons and for the additional reasons that the larger bank has more opportunities for diversification and more knowledge of such opportunities, it seems probable that the larger bank can generally, with a given cost per dollar of loans and in-

vestments, acquire a set of earning assets that are, on the whole, less risky than the smaller bank can. Hence, we can visualize the curve of the function

$$(6a) \qquad r = r'(A)$$

as rising at a decreasing rate.

Other Factors

Now, it may be that, even though an increase in size would bring about a rise in profits or a fall in marginal risk, the bank would be inclined not to desire such a change on other grounds. Or, conversely, the bank may desire an increase in size despite the likelihood of small or negative marginal profits, because of certain other factors. We note briefly some of these other determinants of size preference: prestige, community service, and the desirability of growth. These are not quantifiable and probably vary by place and time; but they are nevertheless operative and should not be by-passed completely. The first of these determinants, prestige, is obvious in nature. There is a certain standing which goes with bigness, especially relative bigness, and banking is not immune to this motive for size increase. For example, Young mentions this as a factor in bank mergers.[1] Community service, the second influence, also need no comment here, having been discussed in Chapter I. And growth itself, apart from considerations of size, carries with it a certain exhilaration which undoubtedly in-

[1] The Banking Situation, p. 48.

fluences size-preference.

Conclusion: Equilibrium Size and the Equilibrium Balance-Sheet Composition

Equilibrium size, asset-mix, and liability-mix of the bank are all simultaneously determined; so it is necessary to go beyond the assumption that size alone varies while all of the component parts of the balance sheet continue to bear the same relationship to each other.

In the course of this chapter certain statistical relationsnips between bank size and balance-sheet components have been pointed out. We noted that the ratio of time deposits to total deposits varies inversely, and the reserve ratio directly, with size. To this might be added the fact that smaller banks tend to have higher capital ratios and, according to Ryan, "rely to a greater degree on loans and discounts than the banks, and a considerably larger percentage of such loans fall into the substandard classification."[1]

This type of data does not, however, inform as to how these balance-sheet components may be expected to respond to size changes. One or two studies have touched on these topics and may be referred to briefly. The Whittlesey study[2] discussed in Chapter VII found little impact on portfolio policy of rapid growth of deposits during the World War II years, but

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[1] Ryan, op. cit., p. 233.

[2] Whittlesey, Bank Liquidity and the War.

for reasons given in the earlier discussion it is not safe to generalize from this experience.

Another study touching on this general problem is the analysis of the nine London Clearing Banks by A. J. Brown,[1] referred to in Chapter VI, which contains some material of relevance here. It will be recalled that Brown attempted to relate asset structure changes both to changes in the structure of interest rates and to changes in total quantity of assets. In Chapter VI the findings as to the relationship of asset structure and interest-rate structure were discussed. Here, we analyze the other relationship: asset structure and bank size.

Brown divided the classes of bank assets into two pairs: (1) cash including short loans) and bills and (2) investments and advances. With reference to the first of these pairs, he found a "strong prima facie tendency to hold more profitable (and less liquid) combinations of cash and bills as the volume of resources available for division between these two assets expands."[2] As between investments and advances, he found that the ratio of the more liquid (investments) to the less liquid asset increased with every increase in total resources available for division between the two. There are two reasons seen for this difference in behavior of the second pair

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[1] Brown, op. cit., pp. 49-82.

[2] ibid., p. 50.

from what one would expect: first, it is easier to change the quantity of investments on short notice than to change the amount of loans, and, second, it is likely that an increase in advances will entail some decline in the standard of marginal safety, so that increasing investments enhances the total liquidity position, counterbalancing somewhat the effect of a drop in the cash/bills ratio.[1]

It is difficult to generalize from such a study - Brown himself calls attention to the "limited range of the material and the limited significance of the results."[2] Although Brown's figures seem to show a negative relation between bank size and liquidity, data concerning our own banking system seem to show a positive relation, as we have noted. However, London banks data refer to the same group of banks at different points of time while Federal Reserve and FDIC data describe different banks at one point of time; and the American banks differ not only in size but in type of location, average size of deposit, deposit-mix and other characteristics. But if we took a group of United States banks and compared them at various points in time with reference to size and asset structure, might we not expect the same relationship as Brown found? The answer probably is "not necessarily." There are various reasons for fluctuations in size - e. g., local boom-bust conditions, seasonal factors, changes in general economic conditions - and it is not likely that bank reaction will be the same regardless of the cause of the size change.

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[1] ibid., pp. 68-69.

[2] ibid., p. 82.

CHAPTER XII

SUMMARY AND CONCLUSIONS

The point has been reached in the development of this study where it is desirable to try to present the work as a whole by means of a brief survey of the main topics discussed. From this position, we can better inspect the forest without being distracted by all those trees, and certain conclusions may suggest themselves.

At the outset, it is well to recall the general nature of the study. The focus has been on the bank firm, with incidental attention to other types of financial firms; the purpose has been to develop a framework for the analysis of the bank and to utilize this framework as a vehicle for the integration of the statistical, historical, analytical, and institutional material available on the subject of the bank.

The theory of the bank firm is an "underdeveloped area" in economics. Nevertheless, there have been contributions of significance in this field, especially during the last few years. These contributions were examined in Chapter II. The possibility of utilizing conventional microeconomic apparatus in discussing bank problems was carefully considered in Chapter III, but its shortcomings for this purpose were found sufficient to justify the infrequency of its use. Therefore, we turned a newer type of theory, which utilizes mostly balance-sheet variables rather than income-statement variables in its framework. This theory, however, is largely in a state of becoming

rather than of being, so it was found expedient to build up an ad hoc theoretical structure, using the rudiments of the newer theory as a guide.

Several factors were considered of paramount importance in the process of developing a theory of the bank firm: (1) the outlook should be from the standpoint of the individual bank or, more exactly, those in control of the bank; (2) the framework should be in balance-sheet terms, since it is stocks which have always received primary attention in banking discussion; and (3) emphasis should be placed on asset-structure problems, since these are the key problems of bank management, but attention should also be given to liability and size matters.

With these as guides, a simple model of the bank was developed (Chapter IV), not so much to give precision to the theory as to serve as shorthand to enable the variables more easily to be kept in mind. Gross yield, risk, and cost were singled out as key variables determining the bank's attitudes (discussed in terms of utility) toward various asset-structures. Just as price theory is largely an elaboration of the statement "Price and output of a good depend on supply and demand," so the theory of the bank asset-mix as presented here consists mainly of the spelling-out of the implications of the statement: "The bank's equilibrium asset-structure depends in large part on the gross yield, risk, and cost associated with the various possible asset-mixes." And just as many volumes and articles have been written in the area of price theory, so it is obviously

true that much more work needs to be done in this area before a really adequate understanding of the bank firm is generally possible.

Following an exposition of a simple three-asset-class model of the bank asset-mix and a brief discussion of the asset adjustment process - means, path, and timing - several chapters (V-VII) were devoted to elaborating the nature of the three key variables, their determinants, and their effects on bank behavior. Involved in all of these three but also influencing banks in other ways is the government, which was singled out for treatment in a separate chapter IX. Problems of the determination of equilibrium liability-mix and equilibrium size were given due attention in Chapters X and XI.

Gross Yield

In this and subsequent sections an effort will be made to summarize the main points of the discussion. Adhering to the sequence of the foregoing chapters, gross yield will be treated first, followed by risk, cost, government, the liabilities side, and the size of the bank.

A key determinant of the gross yield of a collection of assets is the interest rate or, more accurately, the level and structure of interest rates. Although in reality level and structure tend to vary simultaneously, it is useful to discuss separately these two aspects of interest rates as they affect the bank's preferred asset-mix.

Rate Level

The relationship of the level of rates and the desired ratio of reserves to assets is seen primarily in the speculative motive for holding cash in that the lower are interest rates, the more likely it is that they will rise, and the higher they are, the more probable is a fall. Broadening the concept of "liquidity preference" to comprise the whole asset structure, it would seem logical that low rates would induce greater liquidity - i.e., lower-risk, lower-yield assets - as the absolute rate differential between assets narrows, thus reducing the risk premium, and as the expectation strengthens that rates will rise. A few studies seem to support this position, as applied to the reserves/assets ratio. However, there is some empirical evidence which suggests that the "luxury" motive may exert some offsetting effect, at least on the earning-asset mix. That is, at high rates, cet. par., pressure for income will be lower and may induce banks to become more liquid, while low rates will raise pressure for income and may induce the banks to become less liquid, incurring greater risks in striving for higher yields.

Rate Structure

Changes in the structure of rates appear to affect the asset structure in a not surprising manner: a rise in the rates received on one asset-class relative to others generally induces the bank to increase that class as percent of total assets. The problem is made more complicated, however, by two

facts: (1) a measure of control by the bank over the interest rates it receives on loans and (2) other actions it may take as substitutes for, or supplements to, loan rate adjustments in response to a change in the credit environment.

The market structure may probably be designated as the basic determinant of rate changes in response to changes in the demand-supply situation. Banks have much leeway in rates they charge on loans to certain classes of borrowers, virtually none in rates to others, and all gradations between these extremes. However, the actual discretionary power held by the bank may be considerably less than the market structure would indicate, due to the presence of certain other factors: (1) possible long-run reactions of customers, the community, and potential competition on the supply side; (2) other rates charged, including rates on loans (e.g., the "prime rate"), on deposits, on open-market paper, and on rediscounts at the Federal Reserve; (3) custom and tradition; (4) usury statutes. In addition, the bank's actual response in terms of loan rates will be conditioned by (1) the existence and desirability of alternative actions, as described in the following paragraph; (2) the relation between desired and actual loan/asset ratio; and (3) the expected duration of the new environmental conditions.

Important supplements and alternatives to rate changes are (1) credit rationing, mainly an "impact" phenomenon, pending adjustment via other means; (2) changing of credit standards,

in order to change "demand"; (3) changing non-interest terms of the loan contract, in order to move toward equilibrium by altering the "product" variable; and (4) nonprice competition, which has as its purpose the altering of demand, although due consideration must be given to resultant cost changes as well.

Risk

The definition of risk employed in this study is "the range of expected values of the net yield of a collection of assets during a given period." It must be recognized, however, that the bank's attitude toward, and reaction to, a given risk in this sense is determined by what the implications of a given outcome appear to involve to the bank's controlling group. "Risk," in the broader, "man-in-the-street" sense, includes this latter element as well, embracing not only the qualities of the assets but also the situation of the "risker." Accordingly, the discussion is divided into two subsections: (1) the likelihood of change in asset values and (2) the consequences of a given change.

Likelihood of Given Outcome in Asset Values

Three sets of factors are included in this category: credit risk of individual assets, credit risk of the asset-mix, and price (rate)-fluctuation risk.

Among the determinants of the credit risk of particular assets are (1) the expected economic condition of the debtor; (2) characteristics of the debt instrument itself

(e.g., legal status, priority of claim, and added protection to the lender in the form of collateral, guarantee, or voice in the borrower's affairs); (3) familiarity of the bank with the particular form of asset; and (4) length of time until the asset matures.

Credit risk of the asset-mix is not simply the "summation" of individual risks but is strongly affected by the diversification of various kinds involved in the collection of earning assets. Price (rate)-fluctuation risk is measured by (1) the many forces acting upon the markets for the various assets, (2) the nearness of the assets to maturity, (3) the shiftability and discountability of the assets, and (4) the speed with which the price or prices are expected to change.

Consequences of Change in Values

Given the asset structure and the various dimensions of probability of price change, we would like to know the significance of this picture to the bank. Particularly important are the factors determining the significance of a decline in asset values. These factors include (1) the need to record and/or publicize a decline, (2) the reaction of the business community, (3) the need to realize a "paper" loss - which depends on stability of deposits, the availability of funds to borrow, the maturity-distribution of earning assets, and pressures to lend; and (4) the expected consequences of a given realized loss - dependent on the capital ratio, the

expected earnings level, and the structure of capital accounts.

It appears likely that bankers and financial writers overestimate the seriousness of a "paper" loss occasioned by a rise in interest rates; yet, there is some danger in the opposite attitude as well - bankers have been burned before and do not easily forget. At any rate, we must take this attitude into account as a determinant of bank behavior, although noting that it is subject to change.

Cost

In analyzing the effects of cost changes on the asset-mix, it was again found convenient to classify shifts as level and structure changes.

Cost Level

A list of determinants of the level of bank costs would include: (1) the interest rate on deposits, (2) the deposit-mix, (3) the capital ratio, (4) the level of input prices, (5) the input-mix, (6) technology, (7) the quantity of assets, (8) the size- and type-mix of loans, (9) the average time-period of holding an asset, (10) types and rates of taxes, and (11) form of organization (branch vs. unit.). Both on theoretical and empirical grounds, we are led to conclude that higher costs induce the bank to take a riskier position.

Cost Structure

Among the factors behind the structure of costs are (1) size-mix of various asset classes, (2) tax status of various asset classes, (3) technology, and (4) input prices. The effects of a cost structure change will normally be to cause the bank to include more of the asset the cost of which has dropped relatively; but concrete evidence is lacking on this subject.

Government

In addition to influencing the bank's asset-mix via interest rate, risk, and cost factors, the government exerts a direct effect through regulation and certain other means.

Government as Regulator

Major areas of more or less direct government interference with the bank's asset structure are (1) requirements as to minimum quantities of specified classes of assets, (2) stipulations as to types of earning assets forbidden or required, and (3) limits on quantity of certain kinds of earning assets. The first class of requirements is familiar enough, at least the type affecting primary reserves. Generally, this type of requirement specifies not only the amount of reserves, expressed as percent of some other magnitude (deposits, as a rule), but also the form in which they shall be (e.g., balances with a Federal Reserve bank). An investment requirement also would be included in this class.

The second class of regulations has as its primary purpose the limiting of risk. Some of these specify standards of quality by forbidding certain types or requiring selection of earning assets to be made from among stipulated types; others specify terms of lending. The results of these regulations in regard to bank risk-taking are difficult to appraise, but there is some reason to doubt their effectiveness.

Restrictions as to quantity of certain asset classes take several forms: (1) amount of an asset class limited to a certain percent of another magnitude (e.g., capital and surplus), (2) amount owed by one borrower similarly limited, and (3) discretionary authority on the part of a government agency over the amount of certain assets permitted to be carried by a particular bank.

Other Means of Direct Influence

The government in the role of competitor influences the bank's asset-mix by (1) imposing a de facto ceiling rate on certain classes of loans and (2) popularizing certain loan types, both to borrowers and to the banks. Moral suasion and government deposits also affect the asset mix: the former to the extent that it induces the bank to avoid or make certain types of loans or to maintain a more (or less) liquid position; the latter, by forcing the bank to keep more government bonds due to the requirement that these assets must be pledged as "backing" for such deposits.

Liabilities

The liabilities side of the balance sheet has been given only passing attention by "asset" theorists, but there seems to be good reason to give it more thorough treatment in this study due to the importance in banking of several problems connected with it: the deposit-mix, bank borrowing, the capital ratio, and the capital-mix.

Deposit-Mix

The bank's preferences with regard to its deposit-structure - the distribution of deposits among demand, time, interbank, and government - is influenced by (1) the reserve requirement, (2) the interest rate on deposits, (3) the relation between loans and demand deposits, (4) the risk of withdrawal, (5) the requirement of securities pledge, and (6) the asset structure. Several devices, to be listed below as means for changing the size of the bank, are also suitable for altering the composition of its deposits.

Bank Borrowings

On first thought, it might seem that banks borrow because of "need;" but this is too superficial a view to be of much use. We have classed the factors affecting borrowings under the headings of (1) profit, both in the sense of taking advantage of a spread between open-market rates and the rediscount rate and in the sense of utilizing the least expensive source of supplementing reserves; (2) long-term relations between bank and customers; (3) fear of reaction by the bank's depositors, suppliers of funds for borrowing, or regulatory agencies; (4) traditional attitudes, as opposed to "policy;" and (5) lack of information.

Capital-to-Assets Ratio

A wide variety of influences are operative on the bank's capital-ratio preference: (1) the asset-mix; (2) the costs of maintaining existing capital, including both the "opportunity costs" of investment and consumption alternatives given up and money costs due to the bank shares tax; (3) the obstacles in the way of obtaining new outside capital, which, in addition to the items listed under (2), have to do mainly with lack of incentive to the bank to seek additional capital and lack of opportunity to the bank to market such stock favorably; (4) government influence on the capital ratio and on the absolute amount of capital; and (5) such miscellaneous influences as the "rainy day" motive, the size of the bank, its form of organization, and management personalities.

Capital-Mix

Influencing the relative amounts in the various capital accounts are (1) regulations limiting the amount owed by one borrower to a fraction of capital stock and surplus, (2) the requirement that surplus be added to at a certain rate until it equals capital stock, (3) the attitude of customers and bankers toward reductions in certain accounts, and (4) the requirement that national banks start with a paid-in surplus.

Size

Just as the conventional theory of the firm must

include considerations of scale for completeness, so the present analysis required the inclusion of the problem of size: means of changing size, determinants of size-preference, and the relation of size-preference to preference as to balance-sheet composition.

Means of Changing Bank Size

Certain devices, such as changing the amount of capital and borrowings, generally affect size only incidentally (although an increase in capital may be intended to attract deposits, hence increase size). In the case of certain other devices, the size-change goal is more important, but changes in balance-sheet composition may also be a major purpose. Such devices include changing the quantity of deposits, changing the amount of the bank's loans, and the imposition of, or a chan in minimum balance requirement. A final device is usually intended primarily to affect size: the merger.

Determinants of Equilibrium Size

(1) Cost, (2) interest income, (3) risk, and (4) certain miscellaneous types of factors are important determinants of the equilibrium size of the bank.

Data show that bank operating costs as percent of earning assets decline with bank size; but many factors vary along with size- size-mix of loans, type-mix of loans, extent of labor specialization, deposit-mix, and overhead - only the third and fifth being economically related to size.

Relationship between cost and size-change in any individual case depends on the cause of the growth. If the bank grows "passively," as a result of exogenous economic factors, there is reason to expect its costs to approximate those of other banks of the larger size. But if its growth is due to price (deposit interest rate) or nonprice competition, this conclusion as to cost behavior does not follow. The amount of cost increase will depend on the elasticities of deposit supply involved. If the bank grows via merger, it may be anticipated that its costs/assets ratio will be higher than that of a unit bank of comparable size.

Larger banks have a lower rate of interest income to assets for many of the reasons given for cost differentials plus a generally higher reserve ratio. A bank which increases in size can normally expect this result, regardless of the method of increase, except for the merger route.

For reasons related to location, specialization of labor, and size of average loan and deposit relative to size of bank, we may logically expect that an asset-mix involving a given average cost will entail less "average risk" for a larger bank than for a smaller one. Because of the risk factor and other reasons such as prestige, community service, and the attractiveness of growth, the equilibrium bank size may deviate from that size which would maximize expected profits.

Equilibrium Size and Equilibrium Balance-Sheet Composition

The asset-mix, the liability-mix, and the quantity of

assets are simultaneously determined, but there is scarcely any definite information as to the nature of the relationships involved. Important questions that remain to be answered relate to such matters as the interaction of size-change and desired asset composition - liquidity, riskiness, etc. - and of size-change and capital ratio.

Conclusion

The usefulness of this study, once it has been purged of the worst errors of logic and judgement which have doubtless crept in, will depend mainly on whether it stimulates further thinking along the lines followed here or along related lines. As mentioned in the introductory chapter, the purpose of this study is mostly synthesis. Through pulling together the varied and scattered materials on the subject of bank behavior and sorting them out on the basis of a specific framework, it is hoped that (to change the metaphor) the way has been cleared for further progress in this area. This progress may take the form of (1) broadening the analysis to include other firms beside commercial banks, (2) deepening the analysis by studying certain topics which badly need illumination, and (3) applying the analysis to certain problem areas in banking.

Throughout this work there have appeared illustrations taken from outside the field of commercial banking. Particularly numerous are references to mutual savings banks; but insurance companies, consumer finance institutions, and savings and loan associations also have been mentioned. This situation

suggests that perhaps we have a mold that might conceivably be adapted to include a number of other types of financial firms in addition to the commercial bank. To illustrate: all financial firms maintain "reserves" of cash, and probably all have some assets considered safe and liquid, others considered more risky and illiquid. Thus, the three-asset model used in this study could be altered slightly, the categories renamed "cash," "safe assets," and risky assets." On the liabilities side, there is no analogue to the deposit-mix problem, but there are problems of debt-mix (short- and long-term), capital-mix, and the capital ratio.

Under the heading of deepening the theory, several means come to mind. First, it would be desirable to know more about how decisions are made. Although that sort of theory is more a matter of social psychology than of economics, there is need to apply the findings in this field and to integrate them into a more comprehensive and valid theory of bank behavior. The only study of this kind of which the author is aware was made by Chris Argyris[1] covering in detail the organization of one bank. Clearly, this hardly scratches the surface of this field.

Detailed analyses of the behavior of individual banks over a specified time-period constitute a second means through which the theory of the bank firm can be deepened. Some such

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[1]Chris Argyris, Organization of a Bank; a Study of the Nature of Organization and the Fusion Process, (New Haven: Yale University, 1954).

studies have been made and have been helpful as raw materials in this present work. These have been of several types, as seen in the course of this study: some examining in detail a homogeneous group of banks; some taking a sample of banks and doing statistical analysis of them. Other opportunities for research exist: for example, the behavior of large vs. small banks, or banks at specific points or periods of the business cycle, or banks in declining or booming areas, etc.

A closely related means of deepening bank theory is through analysis of specific areas of bank behavior: loan policy (types, rates, maturities, etc); reaction to a tightening of reserves; response to moral suasion; deposit interest policy, and the like. There is no dearth of recommendations by bankers to bankers on these matters, but these only hint at actual practice. Also, there are general comments by students of monetary economics to the effect that "banks generally" or "most banks" do thus and such. However, as we have seen, these comments are occasionally contradictory and, at best, lack definiteness as to how generally and under what circumstances these actions are to be expected. Careful observation and quantitative research on the micro- as well as macroeconomic level are needed to enable the understanding of bank reactions to specified events and circumstances, with the purpose of eventually enabling prediction and control.

Only when much more is known about the decision-making process and about the factors that enter into decisions

in various areas of bank behavior will it be appropriate to try to give the theory of the bank firm some degree of elegance and precision.

The topic of application of the theory was deliberately placed after the discussion of needed refinements of the theory itself in order to give weight to the author's contention that effective utilization of the theory of the bank firm as a tool to guide policy is only a hope at present. Even if the basic framework developed in this study were to find acceptance (a highly remote possibility; the next economist writing in this field will no doubt develop his own - such is the nature of the species), far more information concerning the shape of the functions - concerning bank behavior, in other words - is needed in order to enable the theory to be applied to specific problems. Nevertheless, we may indicate briefly one or two areas in which such application might eventually be made.

One of these areas unquestionably is credit availability. It is generally agreed that the interest rates charged by the bank on loans do not always equalize the supplies of, and demands for, loan funds in various markets; but why does the bank behave in this manner with respect to loan rates? There have been many attempts to describe and explain this phenomenon which, by strict profit-maximization standards, seem irrational. One thinks immediately of Keynes' "Unsatisfied fringe," of course, but, as we saw earlier, there are other ad hoc expressions: some have used the term "credit rationing," others speak of a

"time lag," Ellis uses the concept of a supply band and demand band, intersecting to form an area of equilibrium,[1]" and so forth. Apparently no way has been discovered to integrate the bank's behavior in this regard into a larger system. It is at least possible that this topic could be treated effectively in terms of asset preferences and their determinants, as has been done in an incidental fashion in this study.

A second example: it appears quite likely that discussions, if not the actual analysis, of bank reactions to monetary policy actions would be aided if they could be couched in terms of influences behind bank behavior.. True, the "men at the top" probably do not need such a framework, any more than the business manager needs to utilize the tools of marginal analysis; but more meaningful discussion and more adequate understanding would very likely result from the consistent use of a generally-accepted analytical apparatus.

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[1]Howard Ellis, "The Rediscovery of Money," in Money, Trade, and Economic Growth, p. 256.

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