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PART I

MEANING AND MEASUREMENT

CHAPTER 1
INTRODUCTION AND SUMMARY

The growth in the volume of debt outstanding in the United States during the postwar years can only be described as extraordinary. Any forecast made in 1947 that envisaged such growth over the following two decades would have been considered wildly improbable. Looking back, we can see the conditions that led to this large increase in debt: the nation ended World War II with an extremely small volume of private debt outstanding; its subsequent economic growth has proceeded at a vigorous rate; and there has also been a substantial rise in the price level. But even allowing for these facts, the growth in credit has been impressive.

Concern has been expressed about the rapid and sustained expansion in the volume of financial obligations. Some observers have suggested that the increase in the quantity of credit could have taken place only with a concomitant deterioration in its quality. They draw unhappy comparisons with earlier episodes in our history when a large accumulation of debt was followed by a rapid and damaging deflationary adjustment. Other business and financial analysts are much less concerned. They feel that the postwar developments in the financial sectors have been a necessary, indeed a salutary, part of our economic growth, and they point to other causes for the severe business cycles of the past.

Whether to view the postwar developments in credit quantity and credit quality with alarm, composure, or even satisfaction is an important question; but this volume makes no attempt to answer it. Much more information would be needed than is found in the specific measures of credit risk and credit experience to which we are confined. In addition, even these series related to credit quality fall short of the measures that would be optimal. Our understanding of the role of credit risk in the economy is equally inadequate. In fact, a major conclusion of this book is that we are not in nearly as good a position to determine and assess credit risk as we should be.

Unlike the quantity of credit, for which there exists a great volume of statistics and a constant and extensive stream of research and current analysis, the quality or riskiness of credit is a neglected topic. Because its role in our economic processes is neither well nor widely understood, credit risk rarely becomes a direct and explicit part of the analysis of business and financial conditions. A second reason, which is both cause and consequence of the first is the unavailability, on a current and continuing basis, of statistical time series on credit risk and experience.

Over a decade ago, Geoffrey Moore suggested a research program designed "to advance our knowledge of the factors that are associated with a deterioration in the quality of credit during a boom [and] to expand and improve the flow of information needed to apply this knowledge currently."[1] In the late 1950's the National Bureau initiated a series of research studies, known as the Quality of Credit Program, which in 1960 came under the direction of Dr. James S. Earley. This report is a part of that program.[2]

These studies, along with research efforts by government agencies, trade associations and others, have developed a considerable body of data on actual credit performance, on the financial characteristics of borrowers and on the terms of credit obligations. The information, however, is not well known and is seldom used. Much, though not all, of it is published. Some of the series have not been maintained on a current basis. Most important, perhaps, the data are widely scattered; no single publication carries more than a few of these series. Beyond this, meaningful measures of credit risk are simply not collected in many areas. Thus it is difficult to arrive at a comprehensive and balanced view of what may be happening to the quality of credit.

The goal of this book is to help remedy this situation by providing in a single volume a comprehensive list of most of the known time series on

the subject, supplying the data and charts for the most important (about 190) of these series, making such adjustments in the data as are necessary to facilitate their interpretation and describing their current sources. It is hoped that the knowledge of what series exist and where they may be found will encourage business analysts to examine credit risk more carefully than heretofore, and that the historical data charted in this volume will supply a background and perspective against which future movements of these indicators can be evaluated. In addition to the data, the book examines the concept of credit risk and some of the problems encountered in interpreting the series.

It is also hoped that this book will aid and stimulate further research in the field. The gaps in our statistical arsenal remain large. Our understanding of the importance of credit risk in economic fluctuations, the interpretive problems encountered in the use of the data and similar questions remains limited. This report is designed as a stepping-stone in the long and as yet uncompleted job of learning something about credit risk.

An appropriate and useful follow-up to this compendium would be the regular publication in an appropriate medium of the current data on credit risk, which are now so widely scattered and in some cases available on a continuing basis. It would be highly desirable for one organization, perhaps a government agency or trade association, to publish these series at regular intervals and on a prompt, perhaps quarterly, schedule. A single source of current data would be of great assistance to financial analysts and research workers. The organization which undertook this task might also serve as the focal point of future efforts to fill the statistical gaps and improve the interpretation of the data.

The Everyday Reality of Credit Risk

Credit risk is often considered only in aggregative terms; i.e., as an abstract concept of the risk position embodied in the entire credit structure or a major credit sector. What seems to be overlooked, sometimes is that evaluation of credit risk is a regular and routine part of the everyday business process. Each time a lender decides whether or not to advance credit to a particular prospective borrower, and if so how much, he necessarily takes account of the risks involved.

Credit risk, indeed, is one of the fundamental elements in the economic success or failure of both lenders and borrowers – not just an abstract summary characteristic of the economy at large, invented by theoreticians. It is a factor that is constantly considered and evaluated in the market place. What we are trying to do in this book on the measurement of credit risk is to obtain time series summarizing these daily credit transactions, in terms of the prospective or actual losses and costs involved. Our purpose is to provide information that is necessary, though not sufficient, to assess the risk position of the credit structure and its possible influence on the performance of the economy.

Outline of Topics

This volume is divided into two parts: Part I, a discussion of some of the basic concepts of credit risk and the problems of interpreting the time series on credit risk and repayment difficulties; and Part II, a statistical compendium of those series.

Chapter 2 contains a brief review of the meaning and importance of credit risk. The relationship between credit risk and collection difficulties is discussed, and the proposition is developed that credit risk can be excessively and detrimentally low as well as dangerously high. Then the differential impact of credit difficulties in terms of individual costs and costs to the economy as a whole is examined, followed by observations on the role of credit risk in economic fluctuations.

Chapter 3 takes up the data on credit risk in terms of the major categories and subcategories of the time series and economic sectors covered. The nature and extent of the statistical series that would be desired under ideal conditions are discussed, followed by a summary of the statistical series actually available to us and of the gaps in our statistical arsenal.

Chapter 4 also deals with the data, but here the focus is on their interpretation. The first topic is

the problem of balancing excessive risk against insufficient risk. Other general problems of interpreting and evaluating the data are then considered.

The final chapter in Part I establishes the validity of the loan and borrower characteristics that are used as indicators of credit risk by presenting a synopsis of the evidence linking these characteristics to one or more of the measures of repayment difficulties.

Part II, the compendium, contains a list of all the credit risk series we have found and the data and charts for the 190 series that are considered to be the most meaningful and useful. Also included are brief notes on all the series showing the historical and current sources of the figures and any important related references. A bibliography of useful works on credit quality may be found in this part.

Summary of Findings

The Meaning and Importance of Credit Risk

An understanding of what credit risk is – the probability that a loan will not be repaid according to the terms of the contract – and of some of the basic concepts related to credit risk is important to the proper selection and interpretation of the time series. One such concept is the difference between retrospective (*ex post*) and prospective (*ex ante*) credit risk. Retrospectively, credit risk is measured by actual credit difficulties recorded after the fact: delinquencies, foreclosures, losses, etc. Prospective credit risk, which looks ahead to the future probability of credit difficulties, is often measured by the movements of those loan and borrower characteristics that are known to be related to credit difficulties – such characteristics as repayments-to-income ratios, maturities and loan-to-value ratios. The status of these risk-related characteristics in the stock of outstanding credit is a major determinant of the incidence of credit difficulties. Unfortunately, direct measures of the characteristics of credit outstanding are only infrequently available. Typically, data on characteristics are recorded only at the time the loan is first made. That information is useful, but not sufficient, since the characteristics of the continuing stock of credit change materially as business conditions change – as, for example, the incomes of borrowers rise or fall and as prices advance or decline. Thus, the economic health of the nation, through its impact on the risk-related characteristics of outstanding credit, plays an important role in determining the frequency with which credit difficulties occur.

We are interested, too, in the impact of credit risk and credit difficulties on the economy. One of the least understood points about this is that it is a two-sided question. Almost always, only one side of the problem is discussed: the problem of extending too much credit on excessively generous terms to unreliable and unproductive borrowers. The alternative danger of too little credit provided on too conservative terms is only infrequently recognized. Too much and too risky credit can lead to serious losses, possibly to a spiraling general deflation; too little and too safe credit can lead to a level of production, employment and income significantly below what otherwise would be achieved. In short, the economic consequences can be serious when credit is too safe, as well as when it is too risky. The problem of credit risk, therefore, is that of balancing risks and benefits – of balancing the costs involved in reducing credit risk against the benefits derived from such a reduction, and of balancing the costs of increasing credit risk against the benefits derived from the increase.

Another point that needs to be stressed is that credit difficulties have two different impacts. The first is the private or internal cost, the cost that the lender must absorb when the borrower does not fulfill the credit contract, plus the cost to the borrower. The second is the social or external cost: the loss to the economy of the business activity formerly carried on by the defaulting firm, including the secondary effects of the reduced activity on other lines of business. A series of defaults could impair the willingness of lenders to extend credit and of borrowers to invest. In severe cases lenders might be forced by liquidity needs to call in other loans, some of which then become uncollectable even though their terms would have been met under normal circumstances. The importance of the distinction between the private and social costs is that while the lender can frequently protect himself from the private costs by means of the interest rate he charges, the reserves

he maintains, and sometimes through government guarantees or insurance, there is no protection (outside of general economic stabilization policies) against the social costs, which affect the economy at large.

Just how credit risk and credit difficulties play a role in economic fluctuations is not thoroughly understood. There are some indications that cyclical shifts in credit risk may contribute to bringing about turns in the business cycle. More credence is given, however, to the hypothesis that changes in credit risk and credit difficulties tend to accentuate business cycle expansions and contractions that are caused by other factors. First, changes in lending terms and standards are believed to reinforce cyclical shifts in demand for capital goods – both producer and consumer goods – and thus to exaggerate cyclical swings in business activity. Second, repayment difficulties are believed to have a marked impact on the degree of optimism of business and financial decision makers, again tending to exaggerate the cyclical swings in investment.

Data on Credit Risk

Our purpose is to better understand and better measure the risk position of the nation's credit structure, both as a whole and in its many parts. We need to know what that risk position has been historically, where it stands at present and how it is changing. To do this requires not only a more complete perception of the conceptual facets of credit quality mentioned above, but also, concomitantly, a comprehensive set of time series covering both prospective and retrospective credit risk, including risk-related loan and borrower characteristics, actual credit difficulties and credit ratings. All of the series should be collected on a monthly or quarterly basis, in detail by industry and area and published promptly. All should be based on a sound statistical method of compilation, be unambiguously defined, and be adjusted, as necessary, for breaks in the continuity of the series and for recurrent seasonal movements. For the risk-related characteristics, data are needed (1) on both new loans and the stock of outstanding loans, (2) for both average values and the proportion of weak cases, (3) for each characteristic separately and in combination with other characteristics and (4) for knowledge of the relative importance of each characteristic. For collection difficulties, series are needed (1) on each type of difficulty by degree of seriousness, (2) both as they occur and on the basis of the original date the loans were made.

The series on credit risk and collection difficulties that are available to us fall far short of these requirements. Nevertheless, an impressive body of data can be assembled. The comprehensive list of series in Part II of this book contains some 599 series. From this list, 190 series have been selected as the most meaningful and useful, especially to analysts who want to follow the current status of the nation's credit risk. These data are published, in both tables and charts, in Part II of this book. Even this abridged collection constitutes a formidable volume of data; thus a short list of thirty-four key series has been selected, designed to provide a representative (though necessarily incomplete) cross-section of the currently published data on credit risk. These thirty-four series are listed in Table 3, and are identified by asterisks in Part II.

The series in this book provide information on each of the following credit sectors, and are grouped accordingly.

- Household sector
  - Consumer instalment credit
  - Home mortgages
  - All household credit combined
- Business sector
  - General, including trade credit
  - Bank loans
  - Corporate bonds
  - Mortgages on income-producing properties
- Agricultural sector
- State and local government sector
- Other series

Within each of these groups, the series include the following types, to the extent that they are available.

- Risk-related characteristics
  - Ratios of debt or debt repayments to income
  - Ratios of debt or debt repayments to assets
  - Maturities
  - Debt composition

Credit ratings
Credit collection difficulties
  Default and delinquency rates
  Foreclosure and repossession rates
  Failure rates and bankruptcies
  Loss rates

The market rating or interest rate differential is missing from the above list, although some analysts consider it to be an important and useful indicator of credit risk. While yield differentials have been shown to be associated with credit risk, they reflect other considerations as well, and it seems likely that changes in yield differentials over time vary importantly for reasons unrelated to credit risk. Consequently, market ratings are not included among the time series in this book.

Despite the great variety and volume of the available time series on credit risk, there are many large gaps in our statistical arsenal. The most important of these include (1) the insufficient number of series on risk-related characteristics of the stock of credit outstanding, especially in such important sectors as home mortgages, corporate bonds and mortgages on income-producing properties; (2) the lack of knowledge about the relative importance of various risk-related characteristics; (3) the absence of data on characteristics reported in combination; (4) the shortage of series showing the proportion of loans with characteristics at the weak end of the quality scale; (5) the almost complete absence of credit experience data tied back to the original dates the loans were made; (6) the lack of a quarterly or monthly reporting schedule for many series, and the frequent long publication lags; and (7) the spotty coverage of the series in many areas, particularly in the business sector.

Problems of Interpretation

In addition to the question of how much of the required data on credit risk are available, we need to know to what extent the available time series do in fact provide the information they purport to contain, and, in particular, to know how – and how carefully – the data must be interpreted to avoid misleading conclusions.

Ideally, we want measures that help determine the risk position of the credit structure and whether or not that position is at a hazardous level – i.e., so risky that it might contribute to a downturn in the economy or aggravate a business setback once it got under way – or, alternatively, when the risk position is so conservatively low that it may be holding back business recovery or impeding long-term growth.

The available measures of credit risk do not tell us these things in any precise way. They are not sufficiently definitive and our understanding of credit risk is so incomplete that we do not know where the peril points of the credit structure are. These peril "points" are in fact bands of considerable width, and they tend to shift position over time. Thus, credit terms, borrower characteristics, delinquencies and losses that are quite reasonable at one time under one set of conditions might well represent an excessively risky level some years later, or vice versa.

Three types of changes occur over time in the risk position of the economy and in the location of its peril points: the changes in risk that come about through cyclical swings in business activity, those that develop through long-run shifts in the degree of economic stability and those that result from institutional changes in the credit markets, such as the spread of repayment amortization or federal insurance of bank deposits. All of these changes affect our measurement of and judgment about what might be termed the "credit risk trade-off" – the balance between the hazards of too much credit risk, with its unhappy consequences, and credit that is too safe, and thus fails to play its part in the growth of the economy. Unfortunately, although economists have struggled with this problem for many years, few guidelines are available to tell us where the proper balance might be.

Another general problem of interpretation is the confusion that may arise when data on the lending terms and borrower characteristics of new loans made are mistakenly used in place of data (often unavailable) on the characteristics of the stock of outstanding credit. Frequently, during a strong cyclical movement in business, credit difficulties and new-loan characteristics will show divergent trends. In an economic boom, for example, home mortgage foreclosures will general-

ly decline as incomes and prices rise, while at the same time lenders usually relax the terms and standards on new mortgage loans. Consequently, the foreclosure series will be indicating reduced risk, while the characteristics series will be indicating higher risk. This seeming contradiction is explained by the fact that the risk position of the continuing stock of outstanding home mortgages is not deteriorating along with the new mortgages being made but, rather, is improving because of rising incomes and prices, as is indicated by the decline in the mortgage foreclosures.

At the same time, it is necessary to remain alert to and reach a judgment about the *future* impact of the riskier terms being granted on new mortgages. What will the risk position of the stock of outstanding home mortgages be if and when the boom ends and an economic setback must be weathered? How will the home mortgages presently being written fare? What sort of foreclosure record will they produce when unemployment climbs and home prices fall?

These and many other pitfalls and complications add to the difficulty of interpreting the risk series. Nevertheless, the time series in this book comprise a substantial and valuable body of information. Interpreted with care, and analyzed in the context of other developments in the economy, they are useful guides to the risk embodied in the nation's credit.

Validity of the Risk Measures

Unlike the series on collection difficulties, the characteristics series and credit ratings are not direct (*ex post*) measures of credit risk. Thus, they require validation; it must be shown, by means of cross-sectional tests, that they are related in a significant way to one or another of the measures of credit difficulty.

Not all of the characteristics for which time series are available have been directly validated by such tests. The evidence is broadest and deepest for consumer instalment loans and home mortgages, but in other sectors much less research of this sort has been done. Where evidence is sparse or absent, we rely on circumstantial evidence provided by tests of similar characteristics or tests of the same characteristic for other types of credit instruments.

Our review of these tests suggests that we can, for the most part, be confident that the loan and borrower characteristics included in this book are related in a meaningful way to repayment difficulties. In a few cases, notably maturities, the evidence is not decisive, but it is sufficient to permit us to accept these series as valid measures of credit risk.

Summing Up

It is hoped that the extensive set of time series provided in Part II of this book, supplemented by the conceptual and interpretive discussion in Part I, will prove to be a useful body of information about credit risk. We have emphasized the many problems and pitfalls that face the analyst who ventures into this area. At the same time, the positive features should also be apparent: many useful research studies have been made on the risk of various types of credit instruments and a large volume of risk data is available.

Thus while there is not yet a comprehensive and cohesive theory of credit risk, backed by a definitive body of historical and current statistics, substantial progress has been achieved. We are not at the very beginning of the road. The author hopes this book will provide some of the materials that will enable other analysts to progress further along that road.

[1]Geoffrey H. Moore, "The Quality of Credit in Booms and Depressions," *Journal of Finance*, May 1956, pp. 288-300.

[2]Among the studies that have been published are: "Risks and Returns in Small Business Financing" by Geoffrey H. Moore, Thomas R. Atkinson and Edward J. Kilberg in *Report to the Committees on Banking and Currency and the Select Committees on Small Business, United States Congress, by the Federal Reserve System, Parts 1 and 2*, April 11, 1958, Washington, D.C., 1958, pp. 40-106; Albert M. Wojnilower, *The Quality of Bank Loans: A Study of Bank Examination Records*, New York, NBER, 1962; Martin H. Seiden, *The Quality of Trade Credit*, New York, NBER, 1964; Geoffrey H. Moore and Philip A. Klein, *The Quality of Consumer Instalment Credit*, New York, NBER, 1967; Thomas R. Atkinson, *Trends in Corporate Bond Quality*, New York, NBER, 1967; George K. Brinegar and Lyle P. Fettig, *Some Measures of the Quality of Agricultural Credit*, New

York NBER, 1968; and Avery B. Cohan, *Yield on Corporate Debt Directly Placed,* New York, NBER, 1967; John Herzog and James S. Earley, *Home Mortgage Delinquency and Foreclosure,* New York, NBER, 1970; George H. Hempel, *The Postwar Quality of State and Local Debt,* New York, NBER, 1971. Another study nearing completion is James S. Earley, "The Quality of Credit in the United States: A Summary Volume."