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FINANCIAL CRISIS, FINANCIAL SYSTEMS, AND THE PERFORMANCE OF THE ECONOMY

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I. INTRODUCTION

A. Statement of the Problem

In a dynamic free enterprise economy the financial system undergoes changes. Financial institutions, financial relations among the various classes of economic units and institutions, and the relative size of financial institutions all change. Economic growth is usually accompanied by financial innovation; new types of financial institutions and instruments are invented and put into use.

*This study was prepared during the summer of 1960. After it was decided to publish this study, the pressures of time allowed for only the most cursory of revisions. I hope the reader bears in mind that this is a pilot investigation using a particular approach to monetary and financial relations rather than a finished and polished study.

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This financial evolution is a response to the growth pattern, and whether the new financing techniques and relationships perish or survive depends upon how they affect the functioning of the economy. Financial innovations which are believed to abet financial instability soon disappear or are reduced in importance either as a result of market processes or legislation. Examples which can be cited are "accommodation paper" and "low" margin requirements on stock exchange collateral.¹ Financial innovations such as consumer installment credit which are related to the financing of profitable growing industries expand and become a permanent part of the financial framework.

Even if the financial institutions and instruments do not change, the need to finance economic growth can affect the significance, or weight, of different types of financial instruments and institutions in the total financial system. During a period in which sustained economic growth is taking place we expect the financial system to be subject to two not independent types of change; one due to the financing pressures that the particular growth process operating in the economy places upon the "inherited" institutions, the second due to the invention and adoption of new financial practices.

Innovational activity in the financial sector is a response to the profit opportunities which are generated within an inherited financial structure as sustained growth takes place and will be related to the real sectors that are, figuratively speaking, "powering" the growth.² The pace of financial innovation is a market-induced reaction to the pace and direction of economic growth; however, the nature of the financial innovation that occurs will in turn affect the pace and

¹It may take a long time for an institution to "prove" to be destabilizing. After all, other things may change so that a usage which was not harmful becomes harmful.

²In this paper our primary concern will not be with the growth and evolution of particular financial institutions. Nevertheless it is interesting to point out that there have been a number of stages in the evolution of consumer credit and the institutions primarily related to consumers credit of which the following seem significant.

1. The spread of consumer credit to products and services other than the automobile.

2. The development of automatic consumer credit plans: credit cards and consumer "overdraft" schemes.

3. The development of financing techniques for consumer credit houses which decrease their dependence upon commercial banks.

4. The spread of the portfolio of consumer credit houses to paper that is not the result of financing consumers: this is an exploitation of the techniques they developed for financing their own position.

direction of economic growth. Using consumer installment credit as an example, the real growth of the automobile industry made the consumer paper innovation profitable; the growth and development of consumer paper seemingly was necessary for the development of truly mass purchasing of automobiles. Of course the precise nature of the institutional and usage innovations that take place in a particular environment cannot be forecast, so that the precise effects upon the functioning of the economy of the institutional reaction and innovations-inducing situations cannot be predicted. All that can be forecast is the general nature of the institutional change that is most likely to occur.

In this study the validity and implications of a number of hypotheses relating to the interaction between the financial and real sectors of the economy will be explored. The broadest hypothesis is that the behavior of an economic system with respect to the real variables is not independent of the financial structure of the economy. A hypothesis more closely related to the terms of reference of this paper is that the likelihood of a financial crisis occurring is not independent of the financial structure of an economy and the financial structure reflects the "past" of the economy. The third hypothesis is the most precise and is really a way of phrasing the fundamental problem of this paper. It is that the financial changes that take place during a sustained boom generated by private demand are such that the domain within which the financial structure is stable is decreased as the boom progresses, so that the likelihood that a disturbance of the financial system will lead to a financial crisis is increased as the boom lengthens. This is due to the way in which a sustained boom generated by private demand is financed. If, in addition, it is assumed³ that a sustained boom will not be broken by any endogenous large-scale deficiency of demand, then it follows that if a sustained boom is to be broken it must be broken by a financial crisis. As stated here the hypotheses are not restricted to any particular financial usages; however in the exploration of these problems the effect of particular financial usages upon the validity of these hypotheses will be examined.

³In Chapter VI the results of a number of simulation experiments are presented. These experiments were undertaken in an effort to determine whether an autonomous decrease in investment was a plausible cause of a severe recession. It was not possible to generate a really severe recession without considerable tinkering with the structure of the model.

The results of Chapter VI indicate that "structural" changes are necessary for a severe recession to occur, and within the framework of the model, structural changes can be the result of a financial crisis. Hence we can argue that the results of Chapter VI are not inconsistent with the proposition that a financial crisis is necessary for a severe recession to occur.

Certainly in the short run, and perhaps even in the long run, institutional arrangements affect the course of events. In examining problems of sustaining economic growth and ameliorating cyclical instability in an inherently progressive environment, the nature and evolution of financial institutions must be considered. This paper has a number of missions. These are, to examine:

1. The impact of severe recessions upon the financial system;
2. Whether or not at present a significant threat exists that financial distress will occur;
3. Whether or not the financial system reacts to changes in aggregate demand in such a way that it functions as an automatic income stabilizer.

The way in which the missions of this paper have been phrased makes it natural to think in terms of a two-part system with feedback relations between the two parts. One part is a real system which generates real income and employment. The other part is a financial sector in which the variables are claims, titles and the money flows which are due to the structure of claims and titles. The distribution among types and among owners of financial assets is affected by the income-generating process. In turn the structure of financial relations affects the behavior of the various classes of economic units in their income-determining behavior. The process of income generation leaves behind a financial residue and affects financial values; the financial variable feeds back to the income-generating sector.

During a period of sustained growth generated by private demand the nature and structure of the financial system changes. These financial changes are such that the reactions of the financial system to the recessions that are assumed to be a normal attribute of sustained real growth are affected. The feedback from the financial system to the real sector will tend either to aggravate, dampen or not affect the initiating recession. Such feedback relations between the real and the financial sectors can be self-limiting or reinforcing. If they are reinforcing downward the result of a routinely occurring recession can be an explosive movement which results in a severe financial crisis. (Reinforcing upward movements would tend to generate hyperinflation.) The reaction of the economy to a turning point, upper or lower, is not independent of the past of the economy as reflected in the financial structure.

An interesting and significant aspect of the approach to be examined is that we expect financial institutions and usages to change—both through market-generated innovations and legislation. As institutional arrangements are significant in determining how the

financial system will respond to any stimulus—and therefore how the stimulus will affect the income-generating process, we do not expect one period of sustained growth to be just like another. In particular we expect that lessons are learned, that legislation exists and institutions have been created which protects the economy against the typical financial crises that have been observed. But this learning from the past can result in a type of "Magenot Line" mentality, in which the economy is left vulnerable to new kinds of destabilizing financial reactions. In this paper we will not only consider the present financial relations and the present threat of a financial crisis, but we will also try to extrapolate the growth process under different assumptions, and subject the extrapolated system to various interruptions of income flows.

General problems of finance, business cycles and economic growth are taken up in what follows as well as the topic assigned by the Commission on Money and Credit, which was the possibility of and the problems that would be associated with a severe financial crisis in the United States. The broad scope of the paper proved to be necessary in order to provide a framework which integrated the possibility of a financial crisis occurring with the way in which the economy normally functions. Hence a model of business cycles and growth is presented in which cyclical declines in income flows act as shocks, not necessarily of great severity, to the financial system. It is argued that the ability of the financial system to absorb these shocks without a financial crisis developing depends not only upon the institutional characteristics of the financial system but also upon the way in which economic growth was financed. It is hoped that the perspective on the relationship between real and financial variables, as well as the specific framework for interpreting the financial and real aspects of business cycles and growth which was developed in order to deal with the special problem will turn out to be of general use.

In what follows considerations of international financial relations and international trade and financial variables in generating both income and employment and the structure and the sensitivity to crisis of the financial system are not taken up: basically only problems and relations within a closed economy are considered. The generalization of the framework to include real and financial international economic relations is of course a task worth doing. However, it can be argued that the financial stability as well as the cyclical and growth behavior of the American economy are still overwhelmingly determined by national rather than international factors, so that no great violence is done to reality by this restricted frame of reference.

B. Outline of the Study

This study is divided into three major parts. In the first part, consisting of Chapters II, III and IV, a theory of financial instability and of the effect of financial instability upon the over-all functioning of the economy is presented. These chapters should be interpreted as a step in the development of a complete aggregate theory of an enterprise economy which takes financial factors into account. In the second part, consisting of Chapters V and VI, some evidence of the effect of financial factors upon the behavior of the economy are presented. In the third part, consisting of a single chapter, the role of the central bank, given that a complex financial structure exists, is explored. In Sections C and D of this chapter, the conclusions and the recommendations are presented.

In Chapter II the scope and significance of the financial system is described, financial interrelations and usages are defined, and the relation of the government to the financial system is examined. It is pointed out that the financial system is much broader in scope than the set of organizations called financial institutions; in particular, both corporate finance and household portfolio management and the government guaranteeing and underwriting activity are a part of the financial system.

In Chapter III a particular model of economic growth and business cycles is presented. In this model the severity of recessions depends upon those aspects of consumption and investment demand which are related to the behavior of the financial system. If the financial system is stable, with respect to the shocks it receives from the intermittently recurrent upper turning points, recessions will be mild. But if the financial system is unstable, with respect to shocks of this magnitude, severe recessions will result.⁴

In Chapter IV a theory of financial distress and financial crisis is stated. The relation between balance sheets and money flows is discussed, and how balance sheets and money flows evolve during a growth process, or a sustained boom, is analyzed. It is shown that as a sustained boom powered by private demand is extended in time, financial relations will change, so that the likelihood that a regularly recurring downturn will lead to widespread financial

⁴A constrained accelerator-multiplier model is used to determine demand in Chapter II. The use of this formulation for the determination of demand is not necessary for the general formulation of the relation between real and financial factors which is put forth here. The model used in Chapter VI to determine demand is not an accelerator model, as investment is exogenous.

distress increases. When financial distress becomes so widespread that almost all units in the economy are adversely affected by the financial changes which are taking place, then a financial crisis exists. It is shown how once a financial crisis occurs, the likelihood that a severe recession will take place increases.

In Chapter V a number of observations are made concerning the behavior of the financial system during a sustained boom, a severe contraction and its subsequent stagnation, and during short cycles contained within a strong boom. Although these studies are not conclusive, they are consistent with the hypothesis that systematic financial changes take place during sustained booms which increase the likelihood that a financial crisis will occur. In addition, in Chapter V the changing sources of liquidity for financial institutions are examined.

In Chapter VI a simulation study of the effects of an autonomous decline in investment of different magnitudes upon income and therefore upon the liquidity of the financial system is presented. A model of income determination which had fair success in predicting the behavior of income during a mild recession was subject to both severe changes in private investment and destabilizing structural changes. The destabilizing structural changes were not of the kind that would follow upon a financial crisis, rather the experiments were carried out to see whether the change in the cash flows to and from financial intermediaries which accompany a decline in income will lead to financial distress. In the absence of defaults, runs, and really severe structural changes it seems as if financial distress would not take place. However, if, in addition to the cash flow due to the decline in income, defaults on payments and a structural change which halves transfer payments are added, it seems as if financial distress would occur. Of course, in order to generate this situation, an exogenously determined collapse of private investment is assumed to occur. This may be a most heroic assumption to make in the context of financial stability.

In Chapter VII some brief comments dealing with central banking in the light of the existence of a complex financial structure are made. The conclusion is that the central bank's significance as a guide and director to the economy decreases while its significance as a lender of last resort to the financial system increases as the financial system becomes more complex. Various suggestions for generalizing the lender of last resort functions of the Federal Reserve System as well as centralizing government endorsement and insurance programs within the Federal Reserve are put forth.

C. Conclusions of the Study

At present (fall of 1960) there is no real threat of a financial crisis. The changes in the financial structure, including the

composition of assets of financial institutions, that have taken place since the end of the Second World War have been such that the likelihood of a financial crisis occurring has been increasing. If this trend, which is the result of a boom powered by private demand, is sustained, then the likelihood of a financial crisis being triggered by a routine downturn of income will increase. If financial distress does occur, the efficacy of the various government guarantees, insurance devices and built-in stabilizers will be tested. In the next section of this chapter a number of suggestions, designed to strengthen these anti-crisis elements, will be put forth.

In Chapter VI the effects of a change in aggregate demand upon the savings intermediaries is explored. It is shown that with the present structure of the economy and the present rate of government spending, even as sharp a fall in private investment as took place in 1929-31 should not result in severe financial distress.

If a sharp and sustained decline in income cannot generate financial distress, can a slight downturn in income trigger a financial crisis? As yet the ratio of net worth to debt for both households and nonfinancial business firms is high. Even though stock exchange assets have risen in price during the recent speculative boom, the amount of debt which is based upon stock exchange collateral is still very small. If a revaluation of common stocks takes place due to a decrease in growth expectations, the effect will be upon the equity-owning households and not upon any significant class of financial intermediaries. The resultant decline in stock prices can reduce consumption and investment spending. However, as long as stock market prices are not linked to the assets of debt issuing financial intermediaries, no crisis of the financial sector can result from the behavior of stock prices. Without any crisis in the financial sector the result would be a somewhat deeper and more prolonged recession than has occurred to date in the postwar period not accompanied by any widespread financial distress.

At present real estate assets seem to be a more important potential source of financial distress than stock exchange assets. In contrast to stock exchange assets, real estate assets are collateral for an extensive amount of debt, both of households and business firms, owned by financial institutions. Thus the price level of real estate assets is built into the asset structure (via mortgages) of financial intermediaries. If the price of real estate should fall very sharply, not only will the net worth of households and business firms be affected but also defaults, reposessions, and losses by financial intermediaries would occur. Even though a portion of the real estate mortgages are protected as assets by government endorsements, a large part of such mortgages are not protected. The fact that most mortgages are fully amortized means that the owner's equity increases as time passes, so that for the

relatively seasoned conventional mortgages a really serious drop in the price of the underlying asset would be necessary for losses on this account to affect financial institutions.

Recent experience has been that a fall in income results in large government deficit being generated automatically and quickly. This results in both a large-scale infusion of riskless assets into the private economy and an increase in transfer payments which together with corporate dividend payments tend to maintain disposable income in the face of increased unemployment. The infusion of riskless assets increases the liquidity and the net worth of the private economy. The maintenance of the disposable income of households tends to maintain consumption. On both accounts a large and swiftly reacting government sector makes a serious financial crisis unlikely.

Since the end of World War II the trend has been toward a higher ratio of debt to equity for households. To a much greater extent than in 1946, equity and real estate asset prices now reflect the expectation that the growth of income will continue: the price of some securities can only be explained on the basis that the owner expects a continuation of the observed rate of change in the market price. In addition government debt and other riskless assets have become a smaller portion of total assets. To date the transfer payments have not been a decreasing portion of total income and mainly due to the cold war, total government expenditure has remained a large percentage of the gross national product.

If these changes are extrapolated for another decade then both private debts as a proportion of income and the "speculative" element in prices of real estate and equities will be much larger. A routine decline in income can cause financial distress because of the combination of debt servicing charges and a decline in the price of equities. At such a time whether a financial crisis occurs depends upon the behavior of government transfer payments and the government debt. If transfer payments are sufficiently large to maintain a well-nigh unchanged disposable income and if the government debt or monetary assets which reflect government debt held by the private sector increases rapidly during such a period, then the financial reaction can be damped out before it degenerates into a full-fledged crisis. If a financial crisis does not occur, then consumption and investment should behave so as to moderate the course of the recession. If a financial crisis occurs, then such stabilizing behavior would not take place and a severe recession could occur.

Of course even if widespread financial distress exists, so widespread that it will soon degenerate into a financial crisis there is no need for the financial crisis to take place. Appropriate action by the central bank and the government can abort a financial crisis.

D. Recommendations

The recommendations for the improvement of our financial system which follow center around two themes. The first is the need to extend the scope of the Federal Reserve System. The second is the need to revise the legislation dealing with both our financial institutions and income stabilization so that they are consistent with the fact that the normal functioning of our economy results in economic growth.

In Chapter VII suggestions for broadening the scope of the Federal Reserve System are put forth. It is argued that the Federal Reserve System should become the lender of last resort to and the regulator of the entire financial system. The Federal Reserve System might have sections dealing with three separable aspects of the financial system: first the monetary system, second the savings intermediaries, and third the various insurance and guarantee schemes which are now part of the FDIC, FHA, etc.

In regard to the monetary system a few suggestions seem in order. The separation of the time deposit and trustee functions of the commercial banks from the demand deposit functions seem desirable. Perhaps the commercial banks can be divided into two departments. This would be especially necessary if it seems desirable to impose portfolio controls upon the savings intermediaries.

There is no sense in the continued existence of a dual banking system. Nonmember banks are an anachronism. Also there seems no sense in allowing peculiar state laws to prevent branch banking from developing. State-wide branch banking for national banks seems to be a desirable change in our banking system.

If state-wide branch banking plus universal membership in the Federal Reserve System exists, then it may be desirable to allow member banks once again to issue their own currency. I favor this, for if currency is issued by commercial banks on exactly the same terms as demand deposits, then the public's shift between currency and demand deposits will not be the occasion for open market operations or rediscounting. Anything which decreases the need for transitory open market operations is desirable. In addition, money market financial intermediaries such as the government bond dealers and the consumer credit houses should enjoy guaranteed refinancing on penal terms at the Federal Reserve's Discount Window, in recognition of the fact that discounting is the result of market processes rather than the result of the behavior of particular institutions.

The savings intermediaries, i.e., mutual savings banks, savings and loan associations, time deposit and trustee sections of the

commercial banks, life insurance companies and noninsurance pension funds, should all be subject to standards set by the "saving department" of the Federal Reserve System. Aside from imposing unified standards of portfolio management, consistent with the specialized nature of their liabilities, the Federal Reserve System shall be ready to refinance the position of these institutions in case of a severe cash drain. This eliminates many special purpose regulatory and refinancing agencies.

It seems desirable to recognize that the savings and loan associations are the basic depository intermediary in much of the country. Their one dimensional portfolio is a weakness of these institutions. It may be desirable, independent of the adoption of the general reorganization being suggested, to permit if not to force greater diversification in their portfolios. It also may be desirable to allow savings and loan associations to issue saving bank life insurance.

The existence of an unregulated life insurance sector without guaranteed refinancing source is a weakness of our financial system. Independent of the possibility that lax state laws and administration may be conducive to fraud, no financial institutions of the significance of the life insurance companies should be allowed to exist without a guaranteed refinancing source.

A basic function of banking is to accept contingent liabilities. The federal government today is the acceptor of contingent liabilities on account of Federal Housing Administration, Federal Deposit Insurance Corporation, Veteran's Administration, as well as specialized guarantees to foreign loans, railroad loans, etc. The Federal Reserve System is the appropriate agency for protecting the assets of households, nonfinancial business firms, etc. by guaranteeing deposits (demand, time, savings deposits as well as the cash surrender value of life insurance policies) and of endorsing liabilities such as mortgages. This is so, for if the government has to "make good" on its endorsements, it is the Federal Reserve System which has to permit the money supply to expand.

Incidentally, the ceiling on the size of the deposit that is insured should be eliminated.

A viable free enterprise economy in the United States grows. The size of the government debt relative to other assets and other transfer payments relative to disposable income are important factors in determining the financial stability of the United States. Unless growth can be achieved with a price level which falls so that gross national product in current dollars remains constant, financial stability will require both a secular rise in the national debt and a secular rise in the transfer payments.

The secular rise in the national debt may occur if the government is a large part of income and a modest fall in income generates a large deficit. The secular rise in transfer payments will take place as a routine matter only if the fundamental underlying philosophy results in their being designed to maintain the recipient's income at some "large" share of the income of an employed worker.

II. FINANCIAL SYSTEMS BROADLY CONCEIVED

A. Introduction

Economic analysis lacks an over-all, integrated view of the financial system of a private enterprise economy. There are separate analyses of the various parts such as financial intermediaries, the monetary system, corporation finance, government finance, and private finance. But there is no over-all view of the financial structure and relations and how these aspects of a private enterprise economy affect its functioning: whether functioning is measured on the "micro" level of the efficient allocation of resources and the distribution of income or on the "macro" level of employment, stability, growth and price level behavior. Obviously it is beyond the scope of this chapter in a work directed at a special problem to offer such an integrated view of the financial system. However, since this paper "sells" a point of view—that financial relations are important in determining the stability characteristics of a private enterprise economy—it is necessary to sketch an approach to the study of financial systems. This will be the first task of this chapter.

The second task of this chapter is to classify the various financial interrelations within the "private" economy as it is and to describe significant financial usages. The third task of this chapter is to examine the role of the government as a financial institution.

B. A Brief Over-all View of the Financial System

One aspect of each economic unit is its balance sheet. This is a statement of its assets and its liabilities, of its ownership interest in and claims upon other economic units and of other economic units' ownership interest in and claims upon it. The balance sheet is both a resumé of past economic activity and a reflection of current decisions. The various liabilities in existence mainly represent past transactions, but portfolio changes enable the balance sheet of any unit to reflect current attitudes. Although the acquisition of a particular asset by a particular unit may be the result of a portfolio change, we have to look at how the various financial assets in a balance sheet had their origin as liabilities in order to understand how the balance sheet represents past behavior.

The fundamental concepts of finance are assets and liabilities. Assets are either things or claims and are owned by an economic unit. Liabilities are either debts or ownership interests (called equities) and are owned by an economic unit. By convention the difference between the value of what is owned and the debts of a unit is the value of the ownership interest, and hence by arithmetic the familiar "T" account, that is the balance sheet, balances.¹

There are many different types of debt contracts. They all involve payment commitments of one sort or another, as do the various types of leases and rental contracts which are alternative legal forms with many of the financial and money flow aspects of debts. The legal aspects of the contracts are not of primary relevance for our purposes: what is of major importance is the way in which the contracts result in a division or partitioning of the risk and uncertainty inherent in any economic activity. The alternative financial techniques by which a unit can acquire control over real assets are significant determinants of how uncertainty is partitioned.

The ultimate "natural" economic unit is the household, however as we separate "business" activity from "household" activity, it is customary to think of nonfinancial business firms as another natural ultimate unit. We will first restrict ourselves to considering only these ultimate units, then we will introduce financial intermediaries, and finally we will examine "governments."

Both business firms and households engage in various types of activity in an inherently uncertain environment. These activities have to be financed. In addition, households have "inherited" wealth and current savings, and the particular forms in which this wealth is to be held have to be selected; business firms have "inherited" capital and make investments, and the forms by which these will be financed have to be chosen.

Household and business firm decision makers evaluate the possible favorable and unfavorable outcomes of the various classes of events and they desire to protect their unit against the unfavorable outcomes. In addition to unfavorable outcomes, any economic choice situation has some potential favorable outcomes (if only in relative terms). An economic unit tries to benefit from these

¹The market value of the ownership interest in a going concern can differ from the balance sheet value of the liability, owners equity. Some aspects of the problems centering around these relations are taken up in this work, however the full complexity of the problems centering around the valuation of assets are not handled.

potentially favorable outcomes. In making its decisions, the economic unit combines its evaluations of the situations (the subjective impression of the chances of favorable and unfavorable outcomes), its own attitude toward uncertainty, and the price at which it would acquire the protection against unfavorable and its share of favorable outcomes. The asset and liability structure an economic unit selects reflects the choices that are made between protection against the unfavorable outcomes and benefits from the favorable outcomes of an inherently uncertain situation.

Underlying any analysis of finance is another dichotomy: households as well as business firms have to finance activity; business firms and households both own wealth. However in simple models we usually think of households as owning wealth and business firms as financing activity; hence we can for simplicity of phrasing, think of business firms as issuing debt and equity liabilities, which households own, in order to acquire control over those real and financial assets which are necessary to carry out its activities. However, in what follows, household debts in the American financial picture will not be neglected.

To the owner of an asset a debt is protected, at least to some extent, against some unfavorable outcomes, whereas an equity is not. On the other hand a debt will not fully participate in the benefits accruing to the emitting unit if the outcome is favorable. A debt owner either values protection more than an equity owner or he has a more pessimistic attitude toward the world.

On the other hand to an issuer of liabilities, the greater the extent of debts that are issued, the greater the protection he is pledging other units, and the greater the loss to the owners of his equities if the outcome is unfavorable. The equity or ownership interest in a unit sets the upper limit to the amount of protection a unit can offer other units, and hence can set a limit to the debt which can be issued. However if an activity is heavily financed by debt the pay off per dollar of equity investment is greater if the outcome is favorable.

In a simple nonfinancial business and household world, we can think of business firms having to finance activity and households as the source of the financing. The equity interest is the protection offered the debt owners, for it measures the extent of the unfavorable outcomes that could take place without forcing losses upon the debt owners. Hence if we have two classes of households: one the optimists, the risk seekers, and the second the pessimists or risk averters,² the first class of households will own equity and

²See J. Tobin, "Liquidity Preference as Behavior Toward Risk," *Review of Economic Studies*, Vol. XXV (2), No. 67 (February 1958),

the second class will own debt. Of course by diversifying a portfolio a "degree of riskiness" can be tailor-made for the preferences of each household.

The size and wealth of risk seekers and risk averters will be a determinant of the trade-off in the market between owning equities and owning debts.

The financial system therefore has two "natural" starting places: the optimum liability structure for a firm engaged in particular activities, which determine the kind of real and financial assets it must control, and the optimum asset structure for a household with its special responsibilities. Corporation finance and private portfolio management are the two anchors for the behavior of the financial system.

Because of factors such as the need for communication between investing units and owners of wealth, special knowledge of opportunities, the need for additional and special types of protection, and retailing problems (which exist in all complex economies), a set of financial institutions is "interposed" between the ultimate borrowers (in a simple world of nonfinancial firms) and the ultimate wealth owners. Financial institutions are typically business organizations which own financial assets and emit financial liabilities. This interposition by financial institutions takes various forms among which are the endorsing of other's liabilities, the emission of their own liabilities in order to finance a position in others' liabilities, and pure "brokerage" activities, which make markets. Financial intermediaries, which take a position by interposing both their own expertise and net worth and by the probability theory fact that a large number of "independent" tries decreases the variance of an expected value, transform assets that otherwise would not be acceptable to some classes of wealth-owning risk averters into assets that are acceptable. Financial intermediaries which endorse, make otherwise unacceptable liabilities acceptable because of their expert evaluation and their net worth. Market makers make otherwise unacceptable liabilities acceptable by increasing market participation and liquidity by raising the likelihood that the purchaser can if necessary sell the acquired liability without too great a loss.

The opportunity for financial intermediation of the type that improves the liquidity or solvency attributes of an asset exists whenever there is a differential rate of return between relatively specialized or risky assets on the one hand and liabilities that would be acceptable to strong risk averters on the other. If strong risk averters both own a large portion of wealth and generate a large portion of current savings and if the ability of business firms to generate assets favored by risk averters is limited, then, in the

absence of financial intermediation the rate of return on such favored assets will be relatively low. On the other hand, liabilities generated by business activities not favored by strong risk averters would yield a relatively high return: the differential return is necessary to overcome the aversion to these risks by wealth owners. A financial intermediary which can generate liabilities acceptable to the risk averters while holding the liabilities of unpopular enterprises, its own return depending upon the difference in yields, will not only be profitable but by reducing the differential between finance notes on previously favored and disfavored activities will make the capital market more nearly perfect, and therefore will improve the allocational efficiency of the economy.

Each unit, household, business firm and financial intermediary has a set of books, a balance sheet. If we are dealing with a closed set of books then every asset, aside from the things in the economy, is some unit's liability, and every liability, aside from the net worth of households, is some unit's asset. If we consolidate these sets of books we are left with one class of assets, the "things" in the economy, and one "liability," household's net worth. However, in an actual closed set of books, the uncertainty about the behavior of any given activity is partitioned among the various household's according to the nature of the claims they own. Hence the study of finance is a special case of the behavior of economic units when confronted with specified types of uncertainty, and financial institutions and usages are ways in which the uncertainty borne by a unit can be adjusted to the unit preferences.

In addition to households, business firms, and financial institutions, an economy also includes various government sectors. A balance sheet for the government sectors cannot be drawn on the same basis as for other sectors. Even though governments own tangible assets which have a present value or at least a replacement cost (the present value of a school which generates a service that is not sold is not directly comparable to the present value of a privately owned tangible asset which is expected to generate private net revenues), the positive or negative net worth of governments cannot be imputed to the private units in any straightforward way. As all that is needed is a way of including the government sectors in the financial system, which is consistent with observed behavioral and institutional relations, it is not necessary to attempt to impute the net value of government to the private sectors. (Any such imputed value of government would not be homogeneous with the other assets and liabilities owned by the private sectors.) All that has to be done in order to integrate government into the financial system is to treat the debts of government units as honorary tangible assets of the private sector which owns it.³

(Footnote 3 on following page)

Therefore if we consolidate the books of the private units, net worth of households will equal the value of things plus government debt.

The federal government has the formal power to discharge obligations by creating money; its citizens must accept this money not only for public but also for private debts. State and municipal governments do not have this power: to pay their debts they have to acquire money by either taxes or borrowing. The issuing power of state and municipal governments is quite closely tied to their ability to tax, there is no such constraint on federal government. Hence outstanding debt does constrain state and municipal governments whereas it does not constrain (explicitly) the federal government. In addition it is possible state and municipal governments to default on their debt; it is impossible for a federal government to default on domestic held debt.

State, municipal and federal debt are all considered as honorary tangible assets. Only the federal debt is free of default risk. Hence the federal debt, including Treasury currency, and the gold supply play a special role in the analysis of monetary phenomena. They are the default-free assets whose nominal value is essentially fixed.

C. Financial Interrelations and Usages

In this section a brief discussion of financial interrelations and usages in the American economy will be presented. This will consist of a classification of financial institutions and usages, a brief description of how they affect the partitioning of uncertainty, and an examination of the special problem of organizations with "factored" demand deposits.

Financial institutions are business organizations whose assets are almost all "intangible assets." We exclude holding companies from this class of units. We can separate private financial institutions into three classes: the monetary system, savings intermediaries, and money and capital market organizations. Of course this classification has to be "stretched" to include all of the various types of financial institutions in existence, and in addition particular institution can simultaneously belong to more than one class as we will define them.

³There is of course a lack of homogeneity between government debt and tangible assets as wealth. Presumably the tangible assets reflect the capacity of the private sector to produce marketable output whereas there is no discernible connection between the size of government debt and the government's capacity to produce social benefits."

The monetary system consists of all institutions whose liability is money. Money is that which can be used, by its owner, in its present form to make payments. Money is a liquid asset but not all liquid assets are money, and that which is money to one set of organizations is not necessarily money to another set. For example, the public (households, and ordinary business firms) use demand deposits as money whereas commercial banks in making payments to each other use reserve balances as money.

The monetary system in the United States consists of a part of the Treasury, the Federal Reserve System and the demand deposit departments of the commercial banks. The public's money consists of demand deposits and currency.

One important difference between the monetary system and the other financial intermediaries must be made clear—a difference that is so great that it makes money something quite different from other liquid assets and the monetary institutions quite different from other “financial” intermediaries. The amount of money in existence is not determined by the public; it is determined within the monetary system. Given the reserves and the reserve ratio, the amount of money and also the value of the earning assets owned by the monetary system are in principle determined. The reserves and reserve ratio are both determined within the monetary system. Hence in a very significant way it is not true that the monetary system adjusts to the behavior of the economy; what happens is that within wide limits the economy adjusts to the behavior of the monetary system.

The proposition that the amount of money and earning assets owned by the monetary system is determined by the monetary system requires some slight modification because of institutional peculiarities such as varying reserve requirements among banks and the peculiar, anachronistic differential treatment of currency. There is no good reason why currency should not be the liability of a particular commercial bank, just as demand deposits are. In a well-designed monetary system the shift from demand deposits to currency and back again should not cause any more difficulty than the changing of a ten dollar bill into two five dollar bills: at present to offset such changes the Federal Reserve System engages in what are called “defensive” open market operations.

Within an economy money is an “indestructible” asset; there is nothing that can be done (ignoring the silly case of the physical destruction of currency or coin) by a household or a business firm to change the quantity of money. Money as a demand deposit liability of a particular commercial bank is of course destructible, but not money as a liability of the commercial banking and monetary system.

In all that follows we will assume that the only uncertainty attached to the holding of money relates to the course of the value of money due to changes in the price level. We will not take international trade aspects of monetary phenomena. We will assume that the destruction of money through the illiquidity and insolvency of particular commercial banks will never be allowed to occur again; the central bank and the government will prevent this from occurring. That is, to its owner, in the absence of inflation or deflation, money is the most riskless of assets.

As money is necessary to the functioning of a complex economy, there always exists a riskless asset for the portfolio of strong risk averters. In part the entire complex financial structure can be said to exist in order to lure “money” out of the portfolios of such risk averters, and to overcome the depressing effect upon prices, income, and employment of “hoarding” in a world where for historical, accidental reasons the money supply was “exogenously determined” attribute.

Savings intermediaries are organizations which issue liabilities and use the funds so collected to acquire earning assets. They interpose their collection and asset acquiring skills between householders which save and borrowers. Some of them special in creating liabilities which are particularly well suited to the needs of households with relatively small net worth and subject to cyclical and secular uncertainty as to their income. Although it is not necessary, a large class of these organizations issues liabilities which in fact, although not in law, are demand liabilities. In addition assets of these organizations are heavily weighted by mortgage

In what follows we will only deal with the major savings intermediaries.

There are three classes of savings intermediaries which, slightly different, are treated differently in our laws but whose liabilities are close substitutes and whose assets tend to be similar. These are the mutual savings banks, the savings and loan organizations, and the time deposit portion of the commercial banking system. These savings intermediaries do furnish a large portion of the households with the only financial asset they own and with the close substitute for holding money. The existence and normal functioning of these organizations or a substitute for them is necessary if an economy in which “workers” save is to function without the quantity of money increasing so as to furnish the savers with a riskless liquid asset. These liabilities of these organizations are particularly suited to risk averters, and savers with a small net worth are protection oriented, for they save to escape some of the most unfavorable consequences of the uncertainty they face. Of course institutional changes such as social security laws and

age pensions may change the assets held by households with given preference systems. Compared to say the 1920's, in the 1960's a household of modest means may be concerned with protecting itself against inflation rather than against unemployment.

A rapidly growing set of deposit institutions are the credit unions. These institutions' liabilities are substitutes for deposits in the other savings intermediaries; however, in their asset structure they are more competitive with sales and consumer finance houses than with the other savings depositories.

Life insurance organizations are savings intermediaries which generate a peculiar type of asset, the cash surrender value of the policy. This cash surrender value is a liquid asset which is not as easy to tap as a savings deposit. However it is apparent that in time of tight money and economic distress such assets are tapped by households. Life insurance organizations are most similar to the other savings intermediaries in the asset side of their balance sheet.

The rapidly growing pension funds are another savings intermediary. These organizations' liabilities do not have the current protection aspect that the depository and life insurance cash surrender values have. In addition they are not as restricted in their assets as the other savings intermediaries.⁴

All of the savings intermediaries whose liabilities are both fixed in dollar terms and "de facto" demand liabilities need some way in which they can finance a cash drain. At present the Federal Home Loan Bank provides such a refinancing source for the member Savings and Loan Associations and the Federal Reserve System is a financing source for the time deposit sections of the Member banks. A broadening of the coverage of the Federal Home Loan Bank to cover mutual savings banks and "member" life insurance companies and an integration of the Federal Home Loan Bank's functions into the Federal Reserve System seems to be desirable.

In addition to the monetary system and the savings intermediaries, the conventionally defined financial sector includes various money and capital market institutions. Two functions of these institutions can be identified: to make a market in existing securities and to aid in the flotation of new issues.

One aspect of financial institutions must be examined before we can discuss the full significance of the market "making" function. The profitability of many types of financial institutions depends upon

⁴Open end, or mutual investment trusts can also be considered as savings intermediaries. A comment on these organizations appears on page 195.

the institution being fully invested, i.e., not having any idle cash. At the same time these institutions stand ready to exchange cash for their liabilities on demand (this is also true for a particular bank in a banking system); as a result they have to be able to withstand both transitory and somewhat persistent drains. They do this if they can either sell or pledge some of their ear assets for cash.

We can think of the assets of a financial institution as a position the institution has taken. This position is financed by "borrowing" and the liabilities are the debts issued to finance this position. If there is a demand for cash by the liability owners, the financial institutions must refinance their position. Any unit, let alone a financial intermediary, is "foolish" with respect to the cash position it takes if it has demand or call or short liabilities and no guaranteed way in which it can refinance its position. One way in which it can have guaranteed refinancing is if it owns assets which can always be sold at a moment's notice at a price that does not change much.

For such an asset to exist either there must be a very active market in the asset or there must be some set of organizations which is willing to take a position in the asset under any circumstances. When these conditions are satisfied then the savings and monetary intermediaries can function well. In addition the existence of a market improves the liquidity of assets even if they are owned by households and ordinary business firms. To this extent, the existence of a market makes "risk averters" not willing to own the asset. This explains why "listing" on a stock exchange tends to raise the price of an equity.

The critical step in the evolution of central banking in England occurred when the Bank of England guaranteed refinancing to bill dealers. The guaranteed refinancing of position takers, at a price which prevents too great a fall in the market value of assets they own and deal in from occurring, is a necessary attribute of a well-functioning money market. This is true, for guaranteed refinancing of position takers at stated terms, without limit, prevents the asset price from falling substantially below the level at which the position takers can "make on the carry," i.e. the running yield on the security is greater than the interest rate.

In the present U.S. money market, the financing arrangements available to U.S. government debt dealers and consumer credit houses require re-examination. It may be desirable to open a window at the Federal Reserve System to these organizations in order to assure stability in the market for their assets.

It is obvious that position takers in debt markets, dealing with the assets indirectly owned through financial intermediaries by

averters, are much more important than position takers in equity markets. The specialist making a market in particular stocks on the major stock exchanges is a position taker whose financing is privately arranged. Unless a catastrophic general decline in equity values is imminent, there is no need to provide him with guaranteed financing in addition to his normal sources. Of course, if the market for equities becomes "closely linked" with debt holding and issuing organizations, then a need to guarantee the refinancing of the borrowers on debt (really of the lenders to the borrowers on debt) is necessary.

A defect in the U.S. money market structure today is the absence of any well-defined market in conventional home mortgages. The uniqueness of the underlying real estate is one of the reasons. However accepting and endorsing organizations exist which transform other "unknown and specialized" liabilities into generally acceptable assets. It may be that the costs involved in making conventional mortgages marketable and in servicing them are too high for the fall in yields that can be expected to occur if they were so marketable, so that no private organizations which tend to improve the marketability of mortgages can be expected to arise.

Two sets of financial institutions require special attention because they do not easily fit into this classification. One set consists of the various insurance organizations which do not generate "assets" for their policy holders, the other set being the consumer credit houses.

Non-life insurance companies (and life insurance companies in their term policies) sell a service, protection against a specified set of contingencies. In order to sell this service they have to have a sizable amount of financial assets in order to protect their ability to meet their commitments against a run of "bad luck." Non-life insurance companies' asset holdings are equivalent to the "bank" in a gambling casino.

Of course the services they offer—protection against specified unfavorable outcomes—do enable risk averters to acquire certain tangible and intangible assets they otherwise would not own. However aside from this function of absorbing specified risks these organizations are not really financial intermediaries; they neither create money, make a market in securities, nor handle savings. It is just an oddity of their business that almost all of their assets are intangible.

Consumer credit houses are a peculiar money market financial intermediary in that they do not make a market in any asset,⁵ rather

⁵Ignoring the fact that in many cases the merchant originates the paper and the consumer credit house then buys it.

they own assets directly acquired from the public. They can be classified as a money market intermediary because of the way in which they finance their position. They finance their position by a combination of short-term paper sold mainly to nonfinancial business organizations and state and local governments, etc., borrowing from commercial banks and selling long-term debt on the capital market. They are similar to Government bond houses that they have to be ready to refinance a good part of their position on very short notice. They attempt to protect themselves against this contingency by having unused lines of credit at commercial banks which they tap when needed.

The short-term liabilities of consumer credit houses are competitors of short-term government debt for the portfolios of organizations that otherwise would hold large cash balances. They provide the money market with one of its most significant assets. The development of the market for the consumer credit houses' short-term paper together with the growth of "repurchase agreements technique" for financing Government bond houses is evidence that large-scale idle cash balances will be used if conditions in the money market "tighten."

In a complex financial structure where there exist substitutes for money as an asset for risk averting households as well as substitutes for money as a short-term asset for business firms, the velocity of circulation is very responsive to changes in interest rates. In a world in which financial usages change rapidly the relationship between interest rates and velocity is changeable. Hence the existence of a complex financial structure may pose serious new and ever-changing problems for the central bank as a regulator of aggregate demand.

It is to be noted that we have ignored the very rapidly growing open end, or mutual, investment trusts. To some extent these institutions make equities acceptable to households that otherwise might have restricted their portfolios to debt, as they absorb risk by means of a diversified portfolio and professional management. The liabilities of mutual funds do not have a fixed value; all that the funds guarantee is to redeem their liabilities at the net market value per share of their portfolio. Hence there is no possibility that these institutions will not be able to meet their commitments. A "run" on these institutions would result in pressure on prices on the stock exchange. Only experience will enable us to know the widespread indirect ownership of equities through mutual funds has increased or decreased the stability of the equity market.

D. The Government as a Part of the Financial System

By the government we mean the national state. State, municipal and all other local governments are best considered as another

sector that is quite similar to business firms even though they affect the net worth of households only by their debt. The similarity to private business of these subsidiary governmental units follows from the way in which their money expenditures are restricted to their money receipts. On the other hand the national state can always create money for current spending and debt commitments. This power of the national state, even when it is not being exercised, underlies all the national state's financial transactions and stands as a guarantee of the nominal internal value of the national state's debts and pledges not contained in formal liabilities.

To the households, business firms, and private financial sectors which make up the private economy, the debts and money issued by the national state stand as assets which are not the debt of any unit. As a result, the national debt has many of the attributes of gold. It differs from gold in that its current market value can vary due to changes in interest rate: hence it has a "marketability" risk that gold (and money) does not.

However if an economy has a fractional reserve monetary system, then the monetary system owns assets other than gold. To the extent that the monetary system owns assets which are debts of private units, the money supply contains a portion of the "inhibiting" effects that debts have upon economic units, and a portion of the uncertainty about private economic activity filters through to the money holders. If the monetary system owns assets which are government debts, no such inhibiting effects exist. To the extent that government debt is owned by the monetary system, there will be no impact upon the current value of the public's assets through a change in interest rates; the monetary system absorbs the "market value" risk in government debt.

In Chapter IV, where we will examine the nature and behavior of the financial system in detail, we will examine the distinction between dated, demand, and contingent liabilities. Much of the financial impact of the government can be understood in terms of contingent commitments and how the government will execute them if the contingency occurs.

The entire social security and other public retirement laws are a set of contingent commitments by the government to households. The assets of the social security and other pension funds cannot be imputed to households as can the cash surrender value of life insurance policies, and there is no way a household can "tap" its social security "asset" if it so desires in the absence of the specified event. The social security fund is an anachronism due at least in part to an unwillingness to recognize that the social security laws are not actuarially sound but are designed to provide the elderly with a disposable income. Evidence for this interpretation is the manner

in which the social security benefits are revised from time to time independently of revenues and the fact that households do not have a current asset due to the existence of the social security fund.⁶

If social security payments rise, so that more payments are made by the social security authorities than are credited to their account by the "social security taxes" then a need to sell Government bonds to the private sector (including the monetary system) to finance these payments will arise. It really does not matter whether the "fund" has such bonds or these bonds are newly created by the government as far as the financial impact of this event is concerned.

One of the most important financial aspects of the government is the role of the government as an insurer-guarantor of various private liabilities. The government or a government agency insures bank deposits and savings shares; it guarantees FHA and VA mortgages. These contingent liabilities of the government are a part of the financial scene.

To execute these guarantees, assuming the contingency which makes these liabilities current occurs, involves the acquisition of private assets (the assets of the defaulting bank for example, or the guaranteed mortgage in default) and the sale, or emission, of government debt. If the contingent liabilities are to become actual current liabilities on a large scale, the government must be able to sell its bonds; this is always assuming that the government is not willing to resort to the direct creation of money. But for the government to undertake obligations which require that it be able, if necessary, to sell government debt on a large scale is foolhardy unless there is a guaranteed market for government securities. This guaranteed market depends upon the willingness of the central bank to see that the government honors its commitments.

This cursory examination of the role of the government as a financial institution has resulted in the establishment of a limit to

⁶To the extent that households hold assets in order to be protected against unfavorable events, there is a similarity between asset holding, life insurance, and social security commitments. However asset holdings protect the household against all classes of unfavorable events, life insurance policies offer protection to the extent of the cash surrender value to all classes of events and to the extent of the face value to specified other events, and social security commitments only offer protection against specified events. As mentioned earlier, the existence of specialized protection against particular classes of events may affect not only the volume but also the asset choices of private asset holdings.

the autonomy of the central bank. The central bank can never be so independent that it forces the government to change the financial system by issuing money in order to fulfill the government's commitments. The Federal Reserve Bank must operate so that the acquisition of money by the government, in order to fulfill the government's contingent liabilities such as social security, deposit insurance and mortgage guaranteeing programs will take place without forcing the government to create money on its own account.

Given that the central bank will act so that these government commitments will be honored, then, whenever anything happens that will make these government contingent liabilities current, the private economy will have an infusion of no risk, no private liability money. Therefore the extent of the social security laws and of government endorsement type commitments are determinants of the change in the size and composition of the debt-free money supply that will accompany a downturn in income. To jump the gun on a conclusion that will emerge from what follows, the greater the size of such money flows that accompany a given downturn in income, the greater the chance that the downturn will be stopped and reversed quite soon.

E. Conclusion

The financial system is much more complex and inclusive than the banking system or even the banking system and the financial intermediaries. It includes corporate financial behavior and household asset preferences. In addition the government is a particular and peculiar financial institution due to its right to issue money, which makes its debts different in kind from the debts of private units. The government's role as an endorser and guarantor implies that if necessary (in terms of the occurrences "guaranteed") the government will issue riskless money to the private units in order to make the government's guarantee good: this residual power of the government limits the power of the Federal Reserve System.

III. THE DETERMINATION OF INCOME

A. Introduction

In this chapter we will look at the connections between income propagation and financial flows and relations.

We will first examine the way in which mild and severe recessions differ. Mild recessions are interpreted as an inherent part of an intermittently constrained growth process. It is argued that the supply constraints on income, which can be interpreted as being due to supply conditions, operate to generate both upper and lower turning points. A severe recession will occur only if those elements

which tend to constrain the rate of decline of income are offset. It is argued that a financial crisis provides such an offset to the constraints against large downward movements of income.

How an income expansion is financed and the financial repercussions of an income contraction are investigated. It is shown that if a sustained boom (i.e., a period of growth interrupted only by mild recessions) is the result of investment by private economic units, and no inflation in the prices of equities and real estate-type assets occurs, then the various balance sheets in the economy will be changing so that a higher ratio of the debt liabilities of households and ordinary business firms to total assets results. In particular the household and business assets which are liabilities of financial intermediaries become more heavily weighted by private debts. As a result, the financial environment evolves during a prolonged boom from a stable to an unstable system, so that as the duration of a sustained boom is extended, the possibility that a downturn of not unusual severity will trigger serious financial distress increases.

Serious financial distress can offset and neutralize various constraints upon the income-generating process which tend to sustain income and promote recovery. That is, in the absence of financial distress, the typical recession is mild, but if financial distress occurs the ensuing recession may be severe.

In Part B the distinction between mild and severe recessions will be made and a theory of intertemporal income flows will be stated. In Part C two aspects of the financial implications of changes in income will be examined: the impact upon balance sheets of expansions and contractions and the effect of economic growth upon the value of assets. In Part D the way in which severe recessions can be the result of the impact of financial distress upon the income-generating process will be taken up.

In this chapter financial distress or crisis just happens; they are basically exogenous. In Chapter IV we will examine how balance sheet relations and money flow requirements can be such that a downturn of not unusual cause and severity will generate a financial crisis.

B. Mild and Severe Recessions

1. Introduction. All recessions are not equally severe; they vary in their amplitude, duration, and the interval of time until previous peak income is exceeded. For any variable which has many dimensions, and for which the dimensions are not perfectly correlated, an unambiguous ranking of observations of the variable is not always possible. This is true of the variable "severity" of recessions.

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However, it is obvious that the recession which began in August 1929 was by far the most severe of the recessions that has occurred since 1919.

Are the observed differences among recessions the result of accident, of random factors, or are they the result of a mechanism which is an integral part of the income-generating process? In this chapter a theory of income determination will be sketched¹ and its financial implications will be examined in Part C.²

According to the theory, when the economy is functioning "normally" economic growth takes place; however intermittent interruptions of growth due to supply constraints are an essential part of the "normal" process. These interruptions will usually be mild and after a rather slight and short pause growth will be resumed. Periods in which only such mild interruptions of growth take place will be called a sustained or prolonged boom. A sustained boom can result from increasing private investment or government demand: our primary interest is in a sustained boom that is generated by increasing private investment demand. The increasing expenditures which power the boom require financing that is external to the unit doing the investment. A sustained boom therefore leaves a financial residue in the form of external private liabilities in the balance sheets of the economy. Hence the financial relations which enter into the making of private decisions necessarily change. More important however, the financial changes which accompany a sustained boom powered by private investment demand increase the likelihood that financial distress or crisis will occur whenever one of the routine interruptions of growth takes place. Whenever financial distress accompanies a downturn, the recession that follows will be more severe than it otherwise would be, for financial distress adversely affects the relations determining private consumption and investment.

The generalization of excess capacity during a deep recession may result in a stagnant period during which unemployment and excess capacity persists, even during cyclical peaks. The trans-

¹A formal model with most of the ingredients used in the following can be found in H.P. Minsky "A Linear Model of Cyclical Growth," The Review of Economics and Statistics, XLI, No. 2, Part 1 (May 1959). See also J.S. Duesenberry, Business Cycles and Economic Growth (New York: McGraw-Hill, 1958).

²For a formal analysis of the relation between dynamic economic models and financial variables see H.P. Minsky, "Monetary Systems and Accelerator Models," American Economic Review, Vol. XLVII, No. 6 (December 1957).

formation of the economy from a stagnant to a sustained boom state will not be examined here. However it does involve both the absorption of excess capacity and the improvement of private balance sheets. Both optimism and positions of financial strength are necessary for private investment demand to power a sustained boom.

If a sustained boom results from both externally financed government demand as well as private investment demand, or if large government deficits occur during the "normal" mild recessions that are part of a sustained boom, then the likelihood that the preconditions for financial distress will develop is decreased.

This emphasis upon the financial basis for severe recessions is not to be interpreted as implying that 1) contractions of different degrees of severity cannot occur in the absence of financial distress and 2) that a severe recession can occur only as a result of a financial crisis. First of all, the amplitude and duration of "normal" cycles can vary. In addition it is possible for long lasting recessions to occur if an autonomous exhaustion of investment opportunities takes place. In these circumstances financial distress could be the result of rather than being the trigger for a severe recession. However, the basic contention of this paper is that in fact truly serious recessions require that the normal contraction be reinforced by financial difficulties so that, as a practical policy matter, the prevention of financial distress makes the occurrence of a severe recession unlikely.³

2. Intertemporal Income Determination. To understand how income expansions and contractions take place and their effects upon the financial system, a model of income determination over time is needed. The model to be presented is a very simple member of the class of flexible accelerator-multiplier models. In this model the income of any date is determined, within flexible constraints due to labor force and capital consumption limits, by consumption and investment demand. In turn consumption and investment demand at any time are determined with a commendable lack of precision by past incomes. Hence, in quite an imprecise way, income at any period is determined by previous incomes. Defined in this manner, the flexible accelerator-multiplier model is a framework within which the analysis of income determination over time can be carried out, but it is not a model which can be applied in a mechanical way to yield predictions about the economy.

³The various simulation experiments of Chapter VI indicate that it is unlikely that a severe recession would be generated solely by an autonomous exhaustion of investment opportunities.

Events which take place "outside" the simple model are interpreted as either determining new initial conditions or changing the values of "parameters." This ability to absorb and reflect events that are not included in the formal model makes the model flexible.

The key concepts in the above paragraphs are "flexible" and "lack of precision." The amount of investment that takes place during any period is not strictly determined by the accelerator process but is affected by the behavior of the financial markets; consumption depends upon past consumption, net worth, and liquid assets as well as recent income receipts. The labor force and capital consumption limits, which do not determine rigid ceilings or floors but operate to constrain the rate of growth or decline of income, themselves depend upon the financial environment. By not specifying these relations, while insisting that they exist, we are forced to use the model as no more than a flexible framework.

A skeletal formal model, which ignores complexities such as government and international trade, consists of the following demand determining relations:

1. $Y_t = C_t + I_t$
2. $C_t = \alpha_0 + \alpha_1 Y_{t-1}; 0 < \alpha < 1$
3. $I_t = \beta_0 + \beta_1 (Y_{t-1} - Y_{t-2})$

Relations which determine the labor market and the capital consumption constraints are also part of the model. From the above demand equations we derive:

$$4. Y_t = \alpha_0 + \beta_0 + (\alpha_1 + \beta_1) Y_{t-1} - \beta_1 Y_{t-2}$$

The symbols have their traditional meanings (C = consumption, I = investment, Y = income, α_1 = marginal propensity to consume, and β_1 = the accelerator coefficient: α_0 and β_0 depend upon the past and the current state of the economy; we will use them to feed into the formal model the effects of financial changes. t, t-1 etc. refer to the dates; the period is undefined.)

It is obvious from equation 4 that if the values of the α 's and β 's are known, once two incomes are observed the model can be used to generate all succeeding incomes.

The content of equation 4 can be rewritten in another form, that of the solution equation:

$$5. Y_t = A_1 \mu_1^t + A_2 \mu_2^t + k_0$$

where A_1 and A_2 depend upon the initial conditions, μ_1 and μ_2 depend upon the accelerator and the marginal propensity to consume, and k_0 depends upon α_0 , β_0 , and the marginal propensity to consume ($k_0 = \frac{\alpha_0 + \beta_0}{1 - \alpha_1}$).

The virtue of transforming equation 4 into equation 5 is that from equation 5 we can more readily analyze the characteristics of the time series of income that is generated. Basically equation 5 can generate four different types of time series: monotonically explosive, cyclically explosive, cyclically damped, and monotonically damped. The type that is generated depends upon the value of μ_1 and μ_2 , which in turn depend upon α_1 and β_1 . In terms of the classification of states of the economy into sustained boom and stagnant states, a sustained boom will exist if a monotonically or cyclically explosive time series is generated, whereas a stagnant state will exist if a monotonically or cyclically damped time series is generated. To a great extent the state that the economy is in depends upon the value of the accelerator coefficient, β_1 ; and in what follows, a sharp decline of β_1 , due to the existence of generalized excess capacity, is necessary if the economy is to stagnate.

A peculiar attribute of the monotonically explosive time series is crucial to the model with which we are working. If the initial conditions (the Y_{t-1} and Y_{t-2} which determine A_1 and A_2) do not, figuratively speaking, give the time series a sufficiently large push, the time series which results will have one turning point and the monotonic explosion will take place in the direction opposite to the initial change. The labor market and capital consumption constraints operate to impose new initial conditions upon the income-generating process whenever they are effective.

The operation of the model is as follows: given proper initial conditions and the values of μ_1 and μ_2 (k_0 can be ignored for now), an explosive monotonically increasing time series of income is generated. Income will follow the path indicated by equation 5, with specific A_1 and A_2 and μ_1 and μ_2 , until a tight labor market results at which time not all of income demanded can be produced. This supply constraint causes income to fall short of that indicated by the original equation 5. As a result, equation 5 with new values of A_1 and A_2 will generate future incomes. These new values of A_1 and A_2 are determined by actual achieved incomes, which reflect the constraints upon supply. If the labor force and output capacity due to technical change are not growing sufficiently rapidly, these new initial conditions will generate an upper turning point, so that a falling monotonically explosive time series is generated.

As the stability of consumption and autonomous investment together with the ceiling on capital consumption, including inventory disinvestment, limits the rate at which income can fall, once again aggregate demand as generated by the explosive process would tend to fall outside the constraints. When this happens, new initial conditions are effective which reflect the constraints upon the decline in income. This results in a lower turning point and once again a rising explosive time series of income is generated. In addition to bouncing off floors and ceilings, it is possible for income to crawl along the floor or ceiling for a number of time periods. The end result of this explosive demand process constrained by ceilings and floors is a cyclical path of income. As the ceiling is ever increasing due to labor force growth, net accumulation and technical progress and as the floor is due to a slowdown of inventory disinvestment, which in part is due to the stability and growth of the autonomous income level k_0 , the time series that is generated shows a growing income level that is intermittently interrupted.⁴

The path of income sketched above can be characterized as an intermittently interrupted growth process. A sustained boom in a free enterprise economy is such an intermittently interrupted growth process. If a decade during which this process operates is reviewed, the outstanding attribute is of sustained growth, but during each decade a number of recessions will have occurred. We therefore assert that the normal functioning of a growing economy includes minor or mild recessions.

Minor recessions are not the only interruptions of growth that take place. In addition more serious deep depressions occur. Only one serious depression falls within the time period for which we will carry out some empirical investigations and obviously generalizations from one observation are suspect. Using the National Bureau of Economic Research reference cycle chronology⁵ this serious depression began in August 1929, its trough was in March 1933 and the peak of the subsequent expansion was in May 1937. The peak to peak interval was 93 months. The terminal peak year 1937 was characterized by unusually large unemployment, and reasonably full employment was not achieved until the war years following 1939.⁶

⁴The above is a sketch of what is proven in H. P. Minsky, "A Linear Model of Cyclical Growth," *The Review of Economics and Statistics*, XLI, No. 2, Part 1 (May 1959), pp. 133-145.

⁵G. H. Moore, *Measuring Recessions*, Occasional paper 61, National Bureau of Economic Research Inc., 1958, pp. 260, 261.

⁶The recessions of 1937-38 and 1919-20 while deeper than the other 'mild' recessions during this period were also short: hence, I would not classify them as 'severe.'

The decade 1929-39 can be characterized as a decade of crisis and stagnation. In spite of progress and growth in some significant dimensions, the over-all performance of the economy was not satisfactory. The economy was in a "state" in which its "normal" functioning did not lead to full employment. Many arguments can be brought to bear on the thesis that the economy stagnated during the 1930's. We will not go through these arguments here. Rather we will examine how the contraction that began in August 1929 differed from the other peacetime contractions of the period 1919 to date and how the nature of the contraction set the stage for the behavior of the economy during the 1930's.

The contraction beginning in 1929 was associated with a financial crisis which was by far deeper and wider than any other financial crisis of this period. The financial events of 1929-33 cannot be ignored in an attempt to explain both why the contraction of 1929-33 was different from the other contractions and why the recovery of the 1930's that followed was unsatisfactory. We will fit financial shocks into the flexible accelerator-multiplier framework and see how they can affect the course of income.

There is no need to assume that the triggering event, the downturn of August 1929, is significantly different in its origins and in its initial strength from the other observed peacetime contractions. The same factors we sketched earlier, the slowing down of the rate of increase of income due to supply constraints can explain the initial downturn. What has to be explained is why an unexceptional downturn had serious financial repercussions which other recessions did not have. The explanation that will be advanced is that the financial environment within which the contraction beginning in August 1929 took place was different from the financial environment of the earlier contractions in the period after 1919. This changed financial environment was the result of both the manner in which the sustained boom of the 1920's was financed and the effect upon financial variables of the expectation that sustained growth was inevitable.

It will be argued that once the downturn set off the serious financial crisis, the radical changes in the financial attributes of the economy affected consumption and investment demand. As a result the decline in the rate of decline of income that normally occurs soon after an upper turning point did not happen. Income fell so far that substantial and generalized excess capacity resulted. Both the generalized excess capacity and the financial crisis tended to decrease the coefficient of induced investment, the accelerator coefficient. The protracted period of low income and the amplitude of the decline brought additional pressure upon the financial system, which acted to further damp down any recovery. Hence a closed feedback system was operative in which the effects of financial

changes tended to lower income flows and the decreased income flows tended to induce financial pressures.

A question that obviously requires an answer is whether or not the similar sustained though intermittently interrupted boom which has been in progress since the end of World War II is also breeding a financial environment within which a downturn as severe as that of 1929 can take place. To answer this question we have to look first at how the financial environment is affected by a sustained boom.

C. The Financial Implications of Changes in Income

In this part we will examine how the financial environment within which the income-generating mechanism operates is affected by a sustained boom. Two quite distinct phenomena associated with a sustained boom have to be examined: the way in which the investment that takes place is financed and the effect of the expectation that growth will take place will have upon the value of equity and real assets. The combined effects of these phenomena transform a financial environment which is conducive to income stability and growth into one that can react so as to prolong and deepen any contraction that takes place.

1. The Financing of Investment. When money income rises, spending equal to the rise in income must be financed from some source other than income received. When income falls some of the income received does not result in spending. This way of looking at the financial relations associated with income changes is consistent with the flexible accelerator-multiplier approach toward income generation.

To make the relations a bit more precise, we will distinguish between planned (ex ante) and actual or realized (ex post) income, consumption, saving, and investment.

Planned consumption of any period is given by the consumption function ($C_t = \alpha_0 + \alpha_1 Y_{t-1}$), and we will write it as C_t (ex ante). We will assume that consumption plans are always carried out, so that

$$C_t \text{ (ex post)} = C_t \text{ (ex ante)} \text{ for each date.}$$

When we write C_t (ex ante) $= \alpha_0 + \alpha_1 Y_{t-1}$ (ex post), $0 < \alpha_1 < 1$, consumption is being divided into two parts—an autonomous part represented by α_0 and an induced part represented by $\alpha_1 Y_{t-1}$ (ex post). As $0 < \alpha_1 < 1$, there is no need to examine how the induced part of consumption is financed; it is by the income received in the period $t-1$. As the autonomous part of consumption for a unit may conceivably be greater than $(1 - \alpha_1) Y_{t-1}$ (ex post), a question as to

how the autonomous portion of consumption is financed can arise. We will assume that α_0 depends upon the financial resource of households, including their ability to borrow, so that whatever $\alpha_0 + \alpha_1 Y_{t-1}$ (ex post) may be, it will be financed. This means that if the financial resources of households deteriorate, α_0 and with it consumption will tend to fall. In particular consumption depends, upon the wealth, liquid assets and ability to borrow of those units for which consumption exceeds income.

Planned saving of any period equals the difference between the previous period's actual income and the period's actual consumption: S_t (ex ante) $= Y_{t-1}$ (ex post) $- C_t$ (ex post). Given the planned investment of the period, I_t (ex ante), the planned income will equal planned investment plus actual consumption, Y_t (ex ante) $= I_t$ (ex ante) $+ C_t$ (ex post). For planned income in period t to be greater than actual income of period $t-1$, it is necessary that the planned investment of period t should be greater than the planned saving of period t , for

$$Y_t \text{ (ex ante)} - Y_{t-1} \text{ (ex post)} = I_t \text{ (ex ante)} - S_t \text{ (ex ante)}.$$

The economic units that save are not necessarily the economic units that invest. We will first examine the paths by which money acquired in the process of saving can be transmitted to units that desire to invest, and we will then note that these paths are open to holders of previously acquired cash balances.

We can identify three different ways in which investment can be financed out of ex ante savings: internal, external direct, and external indirect.⁷ In the case where investment is financed internally, the saving (ex ante) of an economic unit finances its own

⁷In real terms any period's investment is the result of using that period's resources. A problem in integrating real and financial factors of economic growth and business cycles is to relate the financial command over resources which a unit must possess to the dynamic income-generating process. To do this a formulation of financial flows is adopted in which household and business savings initially take the form of an accumulation of money, which is then used to acquire financial or real assets. No matter how short a period we use for our examination of the world we will not observe any pools of accumulated money which are closely related to a previous period's income and consumption, rather we will observe the financial changes that accompany the investment put into place. Since we are interested in the dynamic process and market adjustments by which inconsistent plans result in consistent end results, we adopt the convention that a source of financing for investment is ex ante savings.

investment expenditures. No "paper" is generated in this process. The net worth and presumably the market value of the equity liabilities, if they exist, of the investing unit rise by the amount of such internally financed investments.⁸

Two types of external financing of investment can be distinguished: direct and indirect.⁹ In both cases the investing unit issues liabilities (debts or ownership interest) in exchange for the funds it receives. In the case of direct finance a "saving" unit acquires the liability of the investing unit; in the case of indirect finance a financial intermediary acquires the liability of the investing unit. Abstracting from institutional details, the financial intermediary finances the acquisition of the investing unit's liability by issuing its own liabilities.

If $I(\text{ex ante}) > S(\text{ex ante})$, and subtracting the internally financed investment from both investment (ex ante) and saving (ex ante), the willingness to issue liabilities is greater than the ability to acquire liabilities which would exist because of planned savings. If liabilities in excess of planned savings are to be issued, the buyers of some of the liabilities either must have cash balances on hand which are not needed for transactions and which are not the result of the planned savings or they must have the ability to create money.

Before carrying on, it is necessary to point out that there is one way in which I_t (ex post) of real investment can be greater than S_t (ex ante) of real savings even though I_t (ex post) of money investment is equal to or less than S_t (ex ante) of money savings. This can occur if the price level of investment goods falls. For this to happen it is necessary that a fall in prices take place when employment, real income and real demand are all increasing. This is not the way in which the price system now works; if anything, rising employment, demand and income are associated with rising prices. Hence we can assume that price level changes do not operate so as to render invalid the following proposition: If investment in dollar terms is restricted to the available planned dollar savings, then

⁸During a "stagnant" period stock prices may not rise to reflect retained earnings. In this way aggregate investment may be greater than the change in household net worth. During a sustained boom, equity prices may rise by more than retained earnings, so that households net worth increases by more than investment.

⁹This distinction is fundamental to the work of Gurley and Shaw: see John G. Gurley and Edward S. Shaw, *Money in a Theory of Finance*, The Brookings Institution (Washington, D. C., 1960); also J. G. Gurley and E. S. Shaw, "Financial Aspects of Economic Development," *American Economic Review*, XLV (September 1955), pp. 515-538.

real income will not increase and unemployment at least equal to that which accompanies invariant real income in a dynamic economy will appear.

Let us look a bit more closely at how financial intermediation functions in the process by which savings are used to finance investment. The saving unit is either unwilling or unable to acquire direct liabilities of investing units and we can assume that the investing unit is unable or unwilling to issue the type of liability that the saving unit will accept. The financial intermediary issues a liability which the saving unit accepts, and uses the funds so obtained to acquire the liabilities of investing units. If we want to look at this process in terms of the acceptability of the liability of investing units by saving units, the financial intermediary upgrades the liability of the investing unit. (Financial techniques exist in which this "upgrading" role of the financial intermediary is made obvious; these are the various endorsing or accepting financial arrangements.)

Financial intermediaries can be divided into two classes: those whose liability is and those whose liability is not money. The non-monetary financial intermediaries can acquire money only by issuing or selling liabilities which other units willingly accept in exchange for money. The monetary financial intermediaries (commercial banks, the central banks, and portions of the treasury) can create money in exchange for anything they accept as assets.

Whenever the monetary intermediaries exchange their own liability, money, for the liability of an investing unit, the investment planned by the investing unit is financed. No ex ante saving has to take place before investment can be financed by the creation of money. Hence money creation is one way in which I_t (ex post) $> S_t$ (ex ante) can be achieved; note that an investment financed by money creation is financed externally and indirectly. In addition to such loan operations, the money supply can be increased by "open market operations" in which money is created as the monetary institutions purchase existing securities. As a first step, this exchange increases the amount of idle money which can then be activated to finance investment.

When a nonmonetary financial intermediary exchanges its own liability for money, there is no need for the owner of this money to have acquired it by saving it out of the income he received the previous period. It may have been a previously acquired idle cash balance that is now activated by exchanging it for the liability of a financial intermediary. This possibility, that investment is financed by drawing down cash balances, exists for both types of external financing as well as internal financing of investment. To the possibility of financing investment by drawing down cash balances we

have to add the possibility that some of the ex ante savings may be used to build up cash balances. But if realized investment is greater than planned savings then the sum of the increase in the money supply and the decrease in cash balance to finance investment must exceed the additions to cash balance out of ex ante saving.

The direct or indirect financing of investment by drawing down cash balances does not take place in a "price and product" vacuum. During period $t-1$, given the interest rates (prices) and the types of securities (products) available, certain economic units preferred to hold cash rather than earning assets. For these units to switch to earning assets in period t (ignoring changes in expectations) some combination of interest rate increases and the introduction of new types of securities must take place. Usually the substitution takes place within an unchanging set of securities by means of rising interest rates, but at times rising interest rates can induce changes in the kinds of financial instruments in use.¹⁰

The extent to which planned investment in excess of planned savings is realized depends upon the elasticity of the financial system. If there is no possibility of financing investment by drawing down cash balances or increasing the money supply, then I_t (ex post) = S_t (ex ante) in which case Y_t (ex post) = Y_{t-1} (ex post), no rise in money income can occur. If the financial system is infinitely elastic, then I_t (ex post) = I_t (ex ante) and all of planned investment takes place without any rise in interest rates. If the financial system is not infinitely elastic, then I_t (ex post) = I_t (ex ante) can be achieved by a sufficiently large rise in interest rates, assuming the interest elasticity of I_t (ex ante) is zero. If the interest elasticity of I_t (ex ante) is not equal to zero, but if the elasticity of the financial system is not infinite, then I_t (ex ante) > I_t (ex post) > S_t (ex ante) with interest rates rising will result. Whatever the nature of the elasticity of the investment and the financing functions, if Y_t (ex post) > Y_{t-1} (ex post) then I_t (ex post) > S_t (ex ante).

If the financial system is not very elastic then I_t (ex post) < I_t (ex ante) can result in the ratio of Y_t to Y_{t-1} being too small to sustain a continued growth in demand. In this way "tight" money can substitute for labor market tightness in causing an upper turning point. To the extent that this occurs, the rate of growth of the economy will be lower than if labor market tightness generates the downturn.

¹⁰See H. P. Minsky, "Central Banking and Money Market Changes," *The Quarterly Journal of Economics*, LXXI, No. 2 (May 1957), pp. 171-187.

When income declines, planned saving is greater than planned investment, S_t (ex ante) > I_t (ex ante). The difference is a monetary change; either an increase in cash balances or a decrease in the money supply will occur.

When expansionary and contractionary monetary changes occur they may take the form of directly affecting the cash balance of the saving or the investing unit or they may take the form of portfolio changes. Although direct hoarding and dishoarding of cash balances may occur, it is much more likely that the monetary changes which involve changes in cash balances will be associated with portfolio and balance sheet changes by units other than the investing unit.

For example in the United States at present large commercial banks are almost always fully loaned up. During recessions in business activity banks use what otherwise would be excess funds to acquire short-term Treasury debts. During recovery and prosperity periods they decrease their holdings of Treasury debt; at the same time Treasury debt is acquired by nonfinancial business firms, state and municipal governments, etc. These transfers are associated with rising short-term interest rates and put to use what otherwise would have been idle cash balances. The commercial banks in this process free some of their resources to make loans to business. Indirectly, the increase in loans is made possible by the activation of the previously idle cash balances of some non-financial corporations. The important thing for our purposes in this process is that the investment in excess of current planned savings is financed indirectly by this activation of idle cash.

To recognize that investment in excess of planned saving must be financed by monetary changes is to see only half the picture. We also have to look at the liabilities which the investing units issue to acquire the funds needed for investment. When investment is internally financed no new liability need be issued by the investing unit. When investment is financed externally but directly, the investing unit can issue both debt and equity liabilities. The ratio of debt to equity liabilities in the new issues of investing firms need not be different from the ratio of debt to equity liabilities in the directly owned previously outstanding issues.

When investment is financed externally and indirectly, through the intermediation of financial institutions, the liabilities that are issued by the investing unit have to be such that these institutions can and will purchase them. To an overwhelming extent, financial institutions can and do accept only debts as assets. Hence both the current savings that flow through financial intermediaries and the decrease in cash balances that takes place when the liabilities of nonmonetary financial intermediaries are substituted for money in portfolios can be used only to acquire debts. Similarly if an economic

unit is to finance its investment by using the institutions that create money, the investing unit must issue debts.

During a sustained boom, realized investment exceeds ex ante saving and as long as an unconstrained explosive demand process is determining actual income, the ratio of investment to ex ante saving is rising. Hence the proportion as well as the amount of investment that must be financed by monetary changes is increasing. This means that the ratio of new debts to new equity or ownership interest will tend to rise as long as an unconstrained boom is in progress.

If an expansion is the result of private investment, then the nonmonetary financial intermediaries and the monetary system will be acquiring private debts. During a contraction some private debts are paid off. However the periods of sustained booms are characterized by short and mild contractions, during most of the time the economy is expanding. As a result, over the period as a whole, new private debts increase relative to new issues of equities.

In addition as income is related to investment both in terms of over-all demand and productive capacity, the ratio of private debt and hence of private debt payments to income rise as the ratio of debt to equity financing of investment increases.

The financial environment changes in the following ways during a sustained boom due to the need to finance increasing amounts of private investment in excess of ex ante savings: 1) idle cash balances are decreased (i.e., velocity increases), 2) the amount of monetized private debt may increase, 3) the ratio of debt to equity financing rises, and 4) debt payments rise relative to income. In addition during a sustained boom generated by private demand both government debt and gold tend to decrease as a proportion of total assets and of income. As far as government debt is concerned this is a policy choice based upon a belief that governments should not have deficits during otherwise prosperous times. As far as gold is concerned this is due to the fixed price of gold in a world of rising costs and prices. (Of course from time to time new gold discoveries have resulted in the gold supply's increasing relative to income during a period of sustained growth; it is doubtful whether such a period really can be characterized as one in which private investment dominates the growth process.)

All of the above financial changes tend to increase the chances that a not unusual decline in income will result in financial distress.

One qualification to the above is that inflation can reduce the burden of past debts although it cannot reduce the dependence upon monetary changes for financing current investment. However

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inflation both increases the dependence of private investment upon external financing and reduces the willingness of households to exchange money holdings for debt. If an inflationary process is to continue without limit, an increasing ratio of private debts must be acquired by the monetary authorities, although during the early stages of an inflationary growth process, a shift from idle cash balances to equities may offset this tendency.

Even if no inflation of the price level associated with income occurs, a decrease in the ratio of the market value of private debts to equities can take place. This is due to an inflation of the market price of equities that takes place when the expectation that growth will be sustained becomes the basis for the valuation of equities.

2. The Valuation of Assets. Even though a substantial boom is interrupted from time to time by a cyclical downturn, the over-all result of such a period is that economic growth takes place. This means that on the whole the income earned from certain classes of real assets—urban real estate is one example—and the ownership interests in business firms increase as the boom progresses. Of course, in each period of sustained growth there are certain leading sectors which grow at a rate significantly greater than income as well as sectors which do not grow and even some which decline in spite of the over-all growth of the economy. Assuming that the expectation that economic growth will take place becomes progressively stronger as a sustained boom continues, the value of those assets which are expected to participate in the income growth will increase relative to the assets which are not expected to participate. This means that equity and real estate prices will rise relative to debt prices, and this will occur in the absence of any rise in the price level of income.

As is well known the present value of a perpetuity of \$1 per year is equal to $\$1/r$, where r is the rate of discount appropriate to perpetuities of this particular risk and uncertainty class. In what follows we will assume the investments are perpetuities, for buying into a corporation is buying into an organization whose expected life is so long that for all practical purposes it may be considered as infinite. Assume that instead of \$1 per year in perpetuity the expectation is that the return will grow at the rate of g percent per period, and that \$1 is the expected return next period. The present value of such a growing perpetuity at a rate of discount of r percent per year is $\frac{\$1}{r-g}$. (For example, if $r = 10$ percent and $g = 5$ percent then the value of the perpetuity when no growth is expected is \$10 and when growth is expected it is \$20.) Also, since the return will rise to $\$(1+g)$ next period, the present value next period will be $\frac{\$(1+g)}{r-g}$. the market value will grow at g percent per year.

(2)

As the expectation that growth will take place becomes more widely and firmly held as the sustained boom continues, the capitalization rate for assets which are expected to participate in the growth will increase from $\frac{\$1}{r}$ to $\frac{\$1}{r-g}$. The resultant increase in market values can take place over a relatively short period of time, yielding a rate of growth of asset values that is much greater than the expected rate of growth of income.

A speculative boom in asset values can take place on top of the rise in prices due to the generalization of the expectation that growth will continue. This will take place when asset values begin to reflect an expectation that asset values will grow at a rate reflecting the achieved rate of increase during the transition from capitalizing the income streams at $\frac{1}{r}$ to capitalizing them at $\frac{1}{r-g}$.

11 The relevant formulas are:

The present value of a perpetuity whose initial payment is \$1 a year from now equals $\frac{\$1}{1+r} + \frac{1}{(1+r)^2} + \dots = \frac{1}{1+r} \left[\frac{1}{1-\frac{1}{1+r}} \right] = \frac{1}{r}$.

where r is the appropriate rate of discount.

The present value of a perpetuity whose initial payment is \$1 a year from now but which is expected to grow at a rate of g percent per year thereafter ($g < r$) is

$$\frac{1}{1+r} + \frac{1+g}{(1+r)^2} + \frac{(1+g)^2}{(1+r)^3} + \dots = \frac{1}{(1+r)} \left[1 + \frac{1+g}{1+r} + \frac{(1+g)^2}{(1+r)^2} + \dots \right] = \frac{1}{1+r} \left[\frac{1}{1-\frac{1+g}{1+r}} \right] = \frac{1}{r-g}$$

where r is the appropriate rate of discount.

After the passage of one year, and assuming the expectations that growth at the rate g will continue, this same asset at the rate of discount r has the prospect

$$\frac{1+g}{1+r} + \frac{(1+g)^2}{(1+r)^2} + \frac{(1+g)^3}{(1+r)^3} + \dots = \frac{1+g}{1+r} \left[1 + \frac{1+g}{1+r} + \frac{(1+g)^2}{(1+r)^2} + \dots \right] = \frac{1+g}{1+r} \left[\frac{1}{1-\frac{1+g}{1+r}} \right] = \frac{1+g}{r-g}$$

after two years the income stream is

(Footnote 11 continued on next page)

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(3)

In addition to the revaluation of assets due to the building of growth into the capitalization rate, a sustained boom results in narrowing the differential between the discount rate that is applicable to risk free and that for relatively risky assets. Evidence for

(Footnote 11, continued from the previous page.)

$$\frac{(1+g)^2}{1+r} + \frac{(1+g)^3}{(1+r)^2} + \frac{(1+g)^4}{(1+r)^3} + \dots = \frac{(1+g)^2}{(1+r)} \left[1 + \frac{1+g}{1+r} + \frac{(1+g)^2}{(1+r)^2} + \dots \right] = (1+g)^2 \left[\frac{1}{r-g} \right].$$

That is the value of an asset whose expected income stream is growing will grow at the same rate as the income stream as long as the expectation of continuing growth is maintained.

If a speculative boom takes over, that is if the market value of the asset begins to reflect the rate of increase of the market value of the asset that was achieved while earnings were being recapitalized at $\frac{1}{r-g}$ rather than $\frac{1}{r}$, the capitalization value will increase further. The capitalization rate $\frac{1}{r-g}$ includes the expectation that capital gains at the rate of g percent of the capital value will be earned. If capital gains in excess of g percent per year are expected, then the capitalization rate applied to next year's income will rise further. Assume an asset now valued at $\$K_0$, which earns \$1 next year that will grow at g percent, and further assume that the capital value is expected to grow at λ percent ($r > \lambda > g$). Then the capitalization rate of this asset will be $\frac{1}{r-g} + \frac{\lambda K_0}{r-\lambda} - \frac{g K_0}{r-g}$. For example if $r = 15$ percent, $g = 5$ percent, $\lambda = 10$ percent, and K_0 is \$10, the present value of an income stream growing at 5 percent and a capital value growing at 10 percent is \$25.00.

These growth of asset values with growth of income relations throw some light on the equity of taxing "capital gains" at a favorable rate as compared with taxing "income." Ignoring the speculative boom, if investor A invests \$1 in a security which generates an unchanging income stream at an interest rate of r percent he will receive \$ r of taxable income next year. If investor B invests \$1 in a security whose returns are growing at g percent per year he will receive \$ $(r-g)$ as taxable income and a capital gain of \$ g . The total return is the same in the two cases, but under our tax laws the \$ g of "capital gain" is treated at a favorable rate. In addition, by not realizing the capital gain, the \$ g can be compounded whereas all of the \$ r earned by the investor in the asset with the non-growing returns is taxable.

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this can be found in the relative yield of government and private debt securities as a sustained boom progresses.¹²

Therefore on two grounds, the change in the discount rate and the expected growth in the value of the return, during a sustained boom, the market price of equities and real assets increase relative to the market price of debt assets and of income. During a period in which the expectation that growth will be sustained is becoming the basis for the valuation of assets, there will be a rapid rise in the price of equities and of real estate type assets. As soon as the expectation of further growth comes to an end, the value of these assets will fall. Changing expectations of growth will have a strong effect on market prices of assets.

It is worth pointing out that the market price of assets is not based upon any distinction between real and monetary growth. A 5 percent growth in returns because real income grows at 5 percent per year and a 5 percent growth in returns because the price level is expected to rise at this rate in the future will have identical effects upon the present value of the stream of future returns, given that the same discount rate is applicable in the two cases.

Therefore as a sustained boom proceeds it is possible that the market value of equity and property assets in the balance sheets of households and firms will increase relative to debt assets. But these relative valuations depend upon the expectation that the boom will in fact be sustained. If this expectation is broken, or even modified, a sharp fall in the value of real estate and equity assets can occur.

3. The Combined Effects of Financing Requirements and Expectations of Growth. As a result of the need for private units to finance investment in excess of savings by debt instruments and the revaluation of equity type financial and long-life real assets on the basis that growth is expected to continue, during a prolonged boom the balance sheets of the various classes of economic units undergo quite predictable changes, once allowance is made for institutional evolution. The balance sheet relations are an attribute of the financial environment within which the private decisions that determine income are made. The intermittent lapses from full employment and growth that take place during a sustained boom will

¹²This narrowing of the yield differential may be more apparent than real when applied to equities versus debts due to the operation of the capital gains taxes. Also, the apparently lower yield on longer-term government debts when government debt is at a discount may also be due to the special treatment of capital gains.

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always take place in a different and, allowing for institutional changes, a somewhat novel financial framework.

After a sustained boom has been in existence for a time the financial system is more vulnerable to a financial crisis on at least two scores than it was at the time the boom began. In the first place, proportionately more private debts are in existence the longer the boom continues. These debts are not evenly spread among households and firms. Some firms and households are always in the position where any interruption of their receipts will lead to an inability to meet their obligations. But as the ratio of private debts to riskless assets increases, a larger proportion of business firms and households are in this vulnerable position. Hence the financial difficulties associated with any downturn of a given severity will tend to become progressively worse the longer a boom based upon private demand continues.

5 In the second place, the longer a sustained boom has continued the larger the proportion of equity and real property assets whose current values reflect the expectation that growth will continue. This means that an increasing portion of the equity and real assets have market value which would fall sharply if the expectation that growth would continue were abandoned. A sharp fall in asset values affects the net worth of economic units and the protection in existence against outstanding debts. It therefore affects the ability, and perhaps also the willingness, of private economic units to go into debt; this in turn affects the ability and willingness of these economic units to undertake investment.

There exists a third factor which need not but may be operative; it certainly seems to have been operative in the 1929 crisis. This third factor is a speculative boom. If the expectation of growth becomes generalized, the present value of future income streams that are expected to grow increases very rapidly as the effective rate at which discounting takes place falls. If the rate of increase of asset values, which takes place when expectations change to the expectation that growth will be maintained, becomes the rate at which asset values are expected to increase, then the price of assets can become very large compared to current income being earned. These speculative cases are of course even more vulnerable to sharp changes in value due to slight changes in income.

D. The Generation of Severe Recessions

For a severe recession to take place, assuming that our basic model, in which the accelerator coefficient is large enough so that a monotonic explosive time series is generated, is a good enough picture of reality, the various factors which tend to stabilize income soon after a downturn occurs must be offset. Three factors which

make for a quick and high level lower turning point are:

- (1) The maintenance of consumption,
- (2) The inertia in investment in plant and equipment, and
- (3) The limitation upon inventory disinvestment when income turns down.

Each of these stabilizing factors will be examined to determine how, if at all, they can be rendered inoperative or be "broken through." In particular the effects of financial distress will be examined. However before turning to the problems of neutralizing these stabilizing factors we will see how they operate to generate a quick and high level lower turning point.

Recent experience has been that when income turns down consumption is maintained.¹³ If $\bar{Y}$ is the peak income achieved prior to a date t , then, if consumption being maintained is taken literally, no decline in consumption will occur as income declines. If this takes place consumption in the periods following a peak income is $\alpha_0 + \alpha_1 \bar{Y}$, a constant.

A rise in unemployment accompanies a decline in income. For consumption to be maintained with unemployment rising then either the unemployed must maintain their consumption or the employed must increase their consumption. On the whole it appears that the fall in the consumption expenditure of the unemployed is small relative to the decline in their income. In addition there appear to be "trend" factors that tend to raise the consumption of the employed.

This tendency for consumption to be maintained or even increased during recessions is not independent of present day institutional arrangements. Among the usages which tend to maintain consumption are (1) the way in which dividend payments are maintained during slight recessions and the lag of dividends behind earned income, (2) the effect of a progressive income tax on disposable income relative to income before taxes, and (3) the money flows due to government and private pension and unemployment compensation programs. However, even in the absence of such programs and

¹³In each of the three post-World War II recessions personal consumption expenditures, measured in either constant or current dollars, were higher in the years within which the trough occurred (1948, 1954 and 1958) than in the preceding year. Of course these recessions were mild, of the type that occurs during a sustained boom. (See Joint Economic Committee Congress of the United States, Staff Report on Employment, Growth and Price Levels Tables 8.2, pp. 276-279 and 8.3, pp. 280-283.)

and usages, consumption would tend to be maintained, although to a smaller extent than at present in the face of a drop in income as some households will spend more than their disposable income.

For a household to be able to spend more on consumption than its disposable income, as many of the households with unemployment do, it is necessary for it to have financial resources. Household financial resources consist of cash, various types of marketable or callable financial assets, marketable real assets and an ability to borrow. The initial response of a household to a drop in its income is to maintain its consumption by drawing on its financial resources. If the lower income continues for some time, an increasing proportion of those whose income has been lowered will exhaust their private financial resources. When this happens the household is forced to reduce its consumption to its current receipts. Hence we can expect consumption to decline as a recession is prolonged.

The financial assets of households which are especially vulnerable to unemployment seem to be very heavily weighted with the liabilities of the nonmonetary financial intermediaries. If this is true, it is obvious that a necessary condition for the maintenance of consumption in the face of increased unemployment is that these institutions remain solvent and liquid.

As long as it is operative, the tendency of consumption to be maintained has the effect of introducing into the flexible accelerator-multiplier model a high level equilibrium income. If consumption is maintained the entire burden of generating a declining income falls upon investment.

Investment in plant and equipment initially acts as a stabilizer, for it does not respond quickly to a small fall in income. There are a number of reasons why this is true. Investment expenditures on plant and equipment lag behind investment decisions. A modest downturn in current income will not necessarily cause a reduction in investment plans as long as the prospects for economic growth are sustained. In addition maintenance and replacement expenditures on plant and equipment are not reduced to zero as soon as excess capacity appears.

Plant and equipment expenditures, especially for large projects, often require a long lag between the decision and the expenditures. Much of the investment of this type during any period is the result of decisions of previous periods, and it takes a large drop in income before investments in progress are abandoned. As a result it usually takes a number of periods of reduced (or increased) income before plant and equipment expenditures respond to the change in income.

A part of the plant and equipment investment decisions made during any period are autonomous, in the sense that they are not based upon the need to expand specific types of capacity in response to changes in demand. Investment decisions related to innovations are of this type. In addition, a part of the investment decisions being made during any period are based upon long-run growth prospects rather than upon the immediate outlook. Both investments motivated by innovations and by long-run growth prospects are not responsive to short-run declines in income unless the fall in income results in a revaluation of growth prospects; in fact financial ease and the availability of investment goods, including price reductions, may increase such investments during a mild recession.

A part of current replacement and maintenance expenditures replaces or maintains a small but essential part of a complex apparatus. The returns on such investment are very high even in the face of declining demand. In addition many firms delay repairs and maintenance during prosperous times, not wishing to shut down their plant or otherwise curtail their productions. A slackening of demand can lead to an increase in expenditures due to the existence of postponed replacement and maintenance.

During the initial stages of a downturn, inventory disinvestment is usually very large; a large part of the initial change in income is due to the change from inventory accumulation to inventory decumulation. As long as consumption and plant and equipment investment are maintained the amount of inventory disinvestment which can be carried out is limited, for inventories are quickly reduced to the amount considered necessary for current sales. When this happens, the rate of inventory disinvestment falls and the rate at which income falls decreases. A large enough decrease in the rate of decrease of income will generate the lower turning point.

This discussion, of how investment is maintained when income turns down and how the amount of inventory disinvestment which can take place is limited, is based upon the assumption that financial stability exists. If this assumption is valid, the response of financial markets to a decrease in income will aid the stabilization of income. The decrease in inventories that takes place during the initial downward movement of income leads to a decrease in borrowing and an accumulation of cash balances by the firms that cut their inventories. This tends to lower short term interest rates. The lower rates and the increased liquidity of business firms reduces the costs of carrying inventories. Firms may respond by increasing the ratio of inventories to sales.

It is worth noting how household purchases of durables and houses responds to a mild fall in income. Within a stable financial

system, assuming the expectations of growth are not adversely affected, consumer investment, especially in housing, responds to the improved financing conditions which occur with the recession. This has been especially noticeable during the post-World War II recessions.

As long as financial stability is maintained, consumption and investment tend to be maintained at least during the early stages of a recession. This "temporary" maintenance of consumption and expenditures on plant and equipment combined with the behavior of inventory investment and the response of consumer investment such as housing is sufficient to generate a lower turning point.

The accelerator investment relation, $I_t = \beta_0 + \beta_1 (Y_{t-1} - Y_{t-2})$ requires interpretation in the light of the above discussion of the behavior of investment. The autonomous investment represented by β_0 is not directly responsive to changes in income. Total desired inventory investment is related to income, and if consumption is maintained, the amount of inventory disinvestment is constrained. The ability to reduce the stock of more permanent capital is of course limited to depreciation, and the responsiveness of the desired stock of relatively permanent capital to changes in income that are assumed to be transitory is also limited. Hence, unless income falls quite sharply, which basically depends upon a reduction in consumption expenditures, induced disinvestment, because of both supply and demand conditions, will not tend to generate a severe recession.

For a severe recession to take place it is necessary that the stabilizing factors be rendered ineffective. Our discussion of how financial instability is generated is in Chapter IV; here we will examine how "financial pressure" will affect inventory disinvestment, consumption and investment. Financial pressure or distress exists when units' decisions are dominated by the need to meet financial commitments. Widespread financial distress will lead to financial crisis. A financial crisis has two dimensions: one being a liquidity aspect which depends upon whether or not the financial system remains liquid and solvent, the second being a revaluation of equities and real asset dimension which depends upon a change in the expectations with regard to growth. It is possible for either aspect of a financial crisis to occur without the other.

Firms which are under pressure to make payments on outstanding debts, or which have suffered losses due to the financial distress of other units, will try to reduce their inventories below the level that is usually carried given the going level of sales. These distress sales will lower prices, and, if the set of firms under financial pressure is large enough, the prices of the products in question will fall below their "costs." This will not only lower the

net worth of firms in the industry, it will also halt new production or force a reduction in price by suppliers. Financial distress of firms will tend to deepen and prolong a recession on inventory account and thus will tend to give more scope for a reduction in the slower reacting consumption and investment components of income.

Consumption cannot be stabilized in the face of a significant increase in unemployment and a decline in the disposable income of the unemployed unless those who are unemployed as well as those who remain employed maintain their consumption. As long as the various income supplements are not sufficiently large to finance undiminished consumption by those who are unemployed, the unemployed, if they are to maintain their consumption, must finance some of their consumption by using private financial resources. Assuming that the typical "unemployed" household enters this status with some financial resources, the availability of deposits and call loans must not be compromised. In addition the market price of debt instruments, common stocks, and real estate type assets must not fall to any significant extent if consumption is to be financed by drawing upon these resources. A financial crisis which eliminates or sharply reduces private financial resources will force a reduction in consumption to a level consistent with current disposable income.

Of course it is possible for newly unemployed households to restrict their current consumption to their current reduced disposable income even though they have financial assets. Such "hoarding" of wealth in the face of a sharp decline in disposable income is the expected reaction by the unemployed if the outlook for recovery is unfavorable. However if the outlook of the unemployed is basically optimistic, then the willingness to draw upon financial assets to maintain consumption should be dominant. In these circumstances consumption by the unemployed will decline to the level that can be financed by their disposable income only as their financial resources are depleted. In the absence of a financial crisis, this will occur only if the period of unemployment is protracted.

Note that a rolling readjustment (a situation in which different industries or locations are in recession at different times) is less likely to be accompanied by a reduction in consumption than a recession which is concentrated in a few industries or locations.

In addition to depending upon current disposable income and private resources, the ability of unemployed households to maintain consumption depends upon their contractual payment commitments. If such contractual commitments absorb a large part of a household's income when the household is "employed," the fall in disposable income that accompanies unemployment will result in a very large fall in disposable income net of contractual commitments. This

could result in a much more rapid depletion of financial resources or a default (or refinancing) of the contract that leads to the contractual payments. All in all such payments inherited from prosperous times tend to decrease the stabilizing characteristics of consumption, and to the extent that default or renegotiation of such contracts takes place, the decline in income of households with unemployment will result in a decrease in both the net work and cash receipts of the other party to the contract.

If the market value of equity and real estate investments falls sharply then the net worth of households will decrease. This will make households reluctant to invest and will tend to increase the average saving by households at any level of income, i.e., this will lower the value of α_0 in the consumption equation. Such a fall in the market value of assets will take place if the expectation that economic growth will take place is abandoned or if the rate of growth that is expected to occur decreases.

The market value of equity assets can reflect not only the expectations of growth but also the expectations of how the value of the asset will change. If the market value of equity assets reflects a speculative extrapolation of a recent increase in the prices of these assets, then the rate of growth of income that is necessary to validate their market price is much greater than can be achieved. In these circumstances a cyclical downturn by affecting short-run income prospects can trigger a sharp fall in equity prices. The speculative rise in asset prices will tend to raise consumption which of course aided the expansion. The fall in asset prices will tend to lower consumption.

If the ability of financial institutions to honor their obligations is impaired, employed households, finding the liquidity of their assets decreased, will attempt to protect themselves against future financial difficulty by increasing their savings and holding the increase in their assets in risk free form. Hence the impairment of financial institutions' ability to fulfill their obligations, which is the essence of a financial crisis, will both lower consumption and shift the flow of funds among financial assets by saving units.

Consumption expenditures by both the employed and the unemployed will be maintained if financial stability exists and will not be maintained if a financial "crisis" accompanies the downturn.

If financial stability exists, a downturn will be accompanied by favorable financing terms for household investment. Within stable growth expectations household investment by employed households seems to be very responsive to financing terms. However if the market price of real assets decreases, then the protection of the financing organization by the debtor owner's equity will decrease.

These financing organizations will use cash flows not to finance new household investment but to acquire riskfree and liquid assets. Hence if financial distress exists, the stabilizing or even counter-cyclical behavior of household investment will not take place.

The inertia in business investment can be overcome if a sufficiently large number of firms are placed in financial difficulty during a routine downturn in income. Firms in financial difficulty try to generate a large net cash flow from operations, which can be used to "pay off" the debts which have put them into these difficulties. Such firms will both abandon investment plans and minimize maintenance and replacement expenditures. The greater the proportion of business balance sheets heavily weighted with debts, the greater the probability that a large number of firms, representing a large enough fraction of total investment expenditures to appreciably affect income flows, will be in such distress.

If a sharp fall in the price of equity financial assets occurs, then a representative firm will have to sell a larger percentage of the ownership interest in order to acquire a given amount of outside equity financing. This raises the "price" of additional equity capital to the existing ownership and can decrease the willingness of "management" to undertake equity financed investment.

Of course a general fall in the price of equities reflects a general change in the expectations of growth. Investing units are not immune to these expectation changes, hence a fall in equity prices would tend to be associated with a fall in β_0 , the part of investment that is independent of the past of income.

So far we have discussed the problem of the generation of a severe recession within a framework where α_1 , the marginal propensity to consume, and β_1 , the accelerator coefficient, are such that a monotonic-explosive time series is generated. In this framework a first step in generating a severe recession is to prevent too small a rate of fall of income from occurring soon after the initial downturn, as "too small" a decrease in income will generate a lower turning point. Hence the changes in inventory disinvestment, consumption, and investment that are necessary to allow large decreases in income to take place for a number of periods have been specified. It was shown that these changes can be the result of financial difficulties which may accompany the downturn.

If a large decrease in income takes place then there will be generalized excess capacity, that is, excess capacity will exist in almost all branches of industry. Such excess capacity results in the price of second hand capital goods falling. As the cost of producing new capital goods usually does not fall as rapidly as the price of existing capital goods, it will become profitable for some

firms to buy second hand rather than new plant and equipment. In these circumstances a stabilization or even an increase of income will not induce much investment. Within the accelerator-multiplier model, if large-scale, generalized excess capacity exists the accelerator coefficient is small. With a small accelerator coefficient a monotonic damped time series is generated. Once such a change in investment behavior takes place a long recession will ensue, since income will tend toward its equilibrium level as determined by autonomous consumption and investment. Hence depth and length of recessions cannot be separated.¹⁴

During a deep recession, an apparent saturation of capital (an exhaustion of investment opportunities) exists. Of course during such a period technical progress continues, so that the productive capacity of the economy increases without any significant net investment taking place. However the exhaustion of investment opportunities in this case is more apparent than real; it is the result of the depths of the depression. Can "an exhaustion of investment opportunities" take place autonomously, can it be the cause rather than the result of the deep depression?

An autonomous "exhaustion of investment opportunities" will, within our framework, be reflected in a drop in β_0 , the coefficient of autonomous investment which reduces the equilibrium income, or in β_1 , the coefficient of induced investment, which results in a damped behavior of income. A fall in β_0 will take place if either innovations decrease or the expectation that growth will take place is abandoned. At present it seems as if the pace of scientific advances which underly innovational investments is accelerating. Although organizational problems relating to the financing of scientific endeavors will arise if disarmament takes place, for our purposes we can assume that an autonomous slowdown of the scientific work underlying innovations will not occur. The transformation of scientific discoveries into investment activity depends upon the existence of financial stability and optimistic expectations; hence if a deep recession or a financial crisis does not occur there will be no exhaustion of investment opportunities, which will take the form of a decline in β_0 . Therefore for purposes of what might happen to the American economy we can ignore this case.

Can β_1 , the coefficient of induced investment, fall independently of the prior appearance of widespread excess capacity? We will not speculate on this question, rather we will sketch how a severe

¹⁴If consumption is maintained the equilibrium level of income is $\alpha_0 + \alpha_1 \bar{Y} + \beta_0$, consumption plus autonomous investment; however a financial crisis can be expected to lead to a reduction in both consumption and autonomous investment.

recession would proceed if such a decrease were the initiating element. If β_1 falls, instead of an explosive time series, the model would tend to generate a monotonically or cyclically damped time series; income would tend towards its equilibrium level. If consumption and autonomous investment are maintained, this is $\alpha_0 + \alpha_1 \bar{Y} + \beta_0$. As consumption and autonomous investment are a large fraction of full employment gross national product, this damped movement toward the equilibrium income would initially take the form of a protracted but not necessarily a very deep decline in income (even though a cyclically dampened series would overshoot the equilibrium income). However as a long recession will result in both the exhaustion of the financial resources of households with unemployment and the revaluation of equity and real assets to a value consistent with the expectation that growth will not take place, in time a decline in consumption will occur. This will decrease equilibrium income and put further pressure on asset prices. In addition the price level of income may begin to fall. These factors can induce a financial crisis. Once a financial crisis takes place, the equilibrium income is further reduced.

The profile of a severe recession which is initiated by an exhaustion of investment opportunities differs from that of one which has a financial crisis as an initiating factor. A financial crisis severe recession will begin with a sharp fall in income; an exhaustion of investment opportunity recession will begin with a gradual decline of income. Both would have a financial crisis as part of the process, but for a severe recession due to an exhaustion of investment opportunities, the financial crisis will not come early in the recession. Of course as we use a "normal" downturn of income to trigger the financial crisis, even for a severe recession due to a financial crisis, the financial crisis will take place after the peak in income.

Whether a financial crisis is an essential initiating factor for a severe recession or a part of a severe recession that is basically due to other factors, it is sufficient for our purposes that a financial crisis seems to be an essential element of a severe recession. We will now investigate the mechanics of a financial crisis.

IV. FINANCIAL RELATIONS AND FINANCIAL CRISES

A. Introduction

The major problem toward which this paper is addressed is the possibility of a financial crisis occurring. This problem has two facets:

1) the potential for financial distress and crisis in the present economy and in extrapolations of the present economy and, in

particular, the relation between financial crises and severe recessions;

2) the relation of the potential for financial distress and financial crises to the institutions and usages of the financial system and the nature of the protection that the various institutions of the financial system provide against financial crisis. In order to be able to make some progress toward solving this problem, it is necessary to make precise what is meant by financial distress and financial crisis and how these situations can be brought about.

In this chapter we are concerned with the fundamental financial relations among economic units and how the structure of relations is affected by and affects economic growth and fluctuations. The discussion of the relation between financial stability and financial usages and institutions is left to a later chapter where the problems of central banking are discussed. Our main concern here is with the possibility of financial crisis occurring and the processes by which localized financial distress can be transformed into a generalized financial crisis. In order to set the stage for this problem we have to discuss balance sheet relations among economic units and the money flows that are generated by balance sheet relations. The discussion of money flows due to balance sheet relations is in the framework of a general description of money flow relations.

To make clear how a financial crisis can occur we have to look at two types of relations. The first set of relations deals with the financial implications of the income-generating process, in general terms this was done in Chapter III. Although our particular concern is with the behavior of the income-generating process during depressions and recessions, we emphasized the effects upon the financial structure of the manner in which rising incomes are financed. A particular concern of ours is to determine whether a financial crisis can be generated by the effects of a routine decline in income upon the financial position of households, business firms and financial institutions. In this chapter we want to make more precise what the financial position of these units is and how they evolve during periods of growth.

The second set of relations deals with the effects upon income flows of autonomous or induced changes in the financial sectors. These changes occur as the result of changes in both the market value of financial and real assets owned by households, nonfinancial business firms and financial institutions and in the distribution of financial assets among the various contractual types. In Chapter III it was argued that a routine recession can be turned into a severe recession if an exogenously determined financial crisis takes place; in this chapter the genesis of a financial crisis will be explored.

After looking at the income flow and the market value aspects of the relation between the financial and the real sectors in isolation, we will be in a position to combine them in order to determine the conditions under which a "feedback" system of the type discussed in the previous chapter and which results in large and rapid changes in real and financial variable can exist. We are also interested in whether an autonomous shock from the financial sector can trigger once and for all a change in the income-determining characteristics of the economy so as to generate a stable "stagnant" state. In order to do these things we have to examine how sufficiently strong autonomous or induced destabilizing financial developments can occur.

Historically financial crises in the United States are identified with the instability of the commercial banking system. In addition, nonbank financial intermediaries are a potential source of financial crises. In past financial crises the role of money market nonbank intermediation was quite prominent: the crises in England when earnings was in trouble, and the role of stock exchange credit in the crisis of 1929-33 are examples. The decline in the number and the viability of savings intermediaries in 1929-33 was a part of the process by which the financial crisis which culminated in the spring of 1933 was generated.

The above examples of the relation between financial intermediaries and financial crises lead us to another distinction that is useful — the distinction between money market nonbank financial intermediaries and savings intermediaries. The basic distinction between these two sets of financial intermediaries lies in their function: the savings intermediaries role is to make household savings a source of financing for various enterprises; the money market intermediaries are not directly financed by household accumulations and their predominant role is to facilitate the making of a market in some class of financial instruments.

In this chapter we will:

- a) examine the relevant aspects of the balance sheet of an economic unit, and the interrelations among balance sheets;
- b) see how the set of balance sheets that exists and the current decisions at any time generate a set of money flows;
- c) determine how a) and b) are affected by a sustained boom;
- d) define financial distress and financial crisis and determine how they can occur;
- e) see whether the various ways in which financial crises can occur have implications for the income-determining behavior of the various classes of economic units;

- f) examine whether the financial system can act as a built-in stabilizer.

B. The Balance Sheet of an Economic Unit

An attribute of every private economic unit as well as of some public units¹ is its balance sheet. This is a statement of the economic unit's financial and real assets, its debts and the ownership interest in it. It is necessary to examine, for the various classes of economic units, the nature of their balance sheets and how the values in these balance sheets can change if an investigation of the potential for financial distress or crisis is to be carried out.

The assets of an economic unit can be divided into the tangible or real and the intangible or financial assets.²

The debts and the ownership interest in an economic unit make up its liabilities. The debts of all private economic units are some other unit's assets, and aside from households, the ownership interest in an economic unit also shows up as a financial asset of another economic unit. Households are in an important sense the ultimate economic unit, so that the ownership interest of households in themselves (household net worth) is a liability entry for which

¹The balance sheet of a national state is to a large extent meaningless; and if the term is used it has a different meaning from the term as applied to a private unit. A consolidated statement of the existing international assets and liabilities for a national state makes some sense; but there really are no assets that can enter the balance sheet of a government unit such as the United States to offset a liability such as government debt. Basically this is because state issued money is a liability of the national state which does not involve it in any commitment to make payments; and all internally held national debt could by an act of the sovereign state be transformed into such money.

²The tangible or real assets of an economic unit can be classified into the following categories: residential and nonresidential structures, land, producers' durables, and inventories. Each economic unit does not necessarily own some of each class of tangible assets. The financial assets can be classified as debts, public and private, and equities.

In terms of how their prices are affected by the expectation that growth will take place there are many points of similarity between residential and nonresidential structures, land (especially "urban") and equities issued by corporations. We will adopt the phrase "real estate type of assets" to refer to residential and nonresidential structures and land.

there is no opposing asset entry in another balance sheet. Similarly, as tangible assets are ultimate assets, there is no liability entry in another balance sheet whose existence mirrors this real asset. Within a closed set of books³ all liabilities aside from household's net worth are some unit's financial assets; therefore, if the balance sheets of private economic units are consolidated, the value of households' net worth equals the value of the real or tangible assets in the economy. The government debt, fiat money and the nation's gold stock are "honorary" tangible assets. By ignoring foreign debts and assets and the fact that the business firm's balance sheet equity liability may not equal the market value of the offsetting asset, its common stock,⁴ the net worth of households is equal to the value of the natural plus the honorary tangible assets.

The debts of any economic unit that are entered on its balance sheet are commitments to make payments to the owner of the debt. Three general types of commitments can be distinguished (modifications of these types exist):

- a) commitments to make payments on a specified date or time schedule;
- b) commitments to make payments at the initiative of the holder of the debt;
- c) commitments to make payments either on a specified time schedule or at the initiative of the owner of the debt after the occurrence of some defined event. These three types of debt — dated, demand, and contingent — differ in their effects upon the behavior of economic units.

In addition to commitments to make payments on a specified time schedule which are due to liabilities entered upon a unit's

³A closed set of books is a set of balance sheets such that the financial assets and liabilities entered on any particular balance sheet will be financial liabilities and assets on other balance sheets of the set.

⁴That the value of the ownership interest as carried on the books of a firm may not be "fairly" represented by the market price of the firm's shares has two aspects. During a serious contraction or in a period following a serious contraction, corporation retained earnings often do not result in an immediate rise in equity prices. As a result current savings do not result in an equivalent rise in household's net worth, and therefore do not affect consumption. During a boom when growth is expected, the opposite can occur, the rise in asset prices can be greater than the current savings.

books, dated commitments to make payments on a specified time schedule exist because of contracts the unit has signed which are not entered upon the balance sheet. Rental contracts and contracts to pay life insurance premiums are examples of such commitments. By adding such non-balance sheet dated payments contracts to the dated payments contracts which are represented in the balance sheet, a separation of money flows into those which are the result of past decisions and those which are the result of current decisions results.

In terms of their effect upon the unit's equity or net worth account and its future ability to make contracts there is a significant difference between a failure to make a contractual payment on a liability and a failure to make a contractual payment on a savings contract.

A concept of the balance sheet that is more general than the normal presentation and which would be desirable from our point of view is one in which all contractual payment commitments of the type that a unit cannot default on without penalty are entered as liabilities and assets: lease contracts are liabilities and assets as much as mortgages, etc. This would give us a more accurate picture of the financial commitment of a unit especially for periods when firms are trying to conserve their cash or minimize their debt-equity ratios. In the argument that follows, the propositions that are stated are true for this expanded type of "balance sheet."⁵

Very few, if any, nonfinancial economic units have demand liabilities. "Call loans" against stock exchange collateral is an example of a nonfinancial unit demand liability. However a large part of the liabilities of financial institutions are either legally or in fact demand liabilities. The pressure due to the exercise of demand options has been an attribute of financial crises (runs on banks), and a necessary element in a viable financial structure is that an unusually large exercise of the demand option upon financial institutions should not result in any cumulating financial crisis. Basically the function of a lender of last resort such as a central bank is to prevent the occurrence of too wide a set of repercussions from an "unusual" exercise of demand options by making that which is demanded not only elastic to the unit but elastic to the market. In part E of this chapter the key elements in preventing a crisis from occurring due to the exercise of demand liabilities will be taken up.

⁵Apparently life insurance companies in negotiating for the private placement of corporate debt and mortgages on commercial property take lease liabilities into account in determining the credit worthiness of the borrower or, in the case of commercial property, of the principal tenant.

Contingent liabilities are not only contracts such as insurance contracts but also include all endorsements.⁶ If all balance sheets are complete, endorsements would be entered as contingent liabilities and there would be contingent assets as offsetting items. This is of course the way in which commercial banks and acceptance houses enter their endorsements. At the present time the majority of the endorsements that are outstanding are explicit or implicit endorsements of governmental or quasi-governmental agencies. These government endorsements include the two deposit insurance schemes and the various mortgage guarantee programs. Commercial banks, mutual savings banks and savings and loan associations not only have government endorsements on a majority of their liabilities but also have government endorsements as a part of their mortgage portfolios.

The various government unemployment and social security insurance schemes can be interpreted as contingent liabilities. The event that must occur for these liabilities to result in current payments is unemployment or retirement of the worker. By so integrating these programs they can be integrated into the financial system, where they obviously belong. The existence of these schemes is obviously a determinant of household consumption behavior, and as will be evident in Chapter VI, a major determinant of economic stability.

The ownership interest in an economic unit, other than households, does not involve any such contractual commitments by the owner to make payments to the owner. In the case of a corporation or a partnership the contractual obligation usually is one of non-liquidation: that any owner of an ownership interest will be treated as well as any other owner. However, aside from the requirements of the tax laws, no legal commitment to pay dividends exists, and even the tax laws allow for reasonable retained earnings.

Aside from the ownership interests in households, which by law are vested in the household itself, financial and real assets of economic units can be sold. The market value of assets depends on the currently expected stream of future returns and the relevant

Life and other insurance policies are formally contingent liabilities, however the face value payments on these policies are predictable, dated liabilities. In addition, the cash surrender value of life insurance policies is demand liabilities. In further work it might be best to shift the expected contractual payments period on insurance policies in force to the dated liabilities and to include the cash surrender value of life insurance policies among demand liabilities. This would of course result in a double counting of life insurance liabilities.

rate of discount. The market value of debt assets depends upon the size of the payments obligated to these issues and the expected ability to make these payments. The market value of an economic unit's ownership liability depends upon the payments it is expected to make and the confidence with which this expectation is held. In Chapter III we have discussed how the expectation that growth will occur will affect the market price of assets.

The financial assets owned by any economic unit are usually called its portfolio. An economic unit is the beneficiary of the commitments of other units as stated in these assets. Within very wide limits an economic unit is free to exchange its financial and tangible assets for money and money for assets. We will call such transactions involving both financial and tangible assets portfolio transactions.⁷

It is obvious that during the process of growth and fluctuations such portfolio transactions occur, not only in existing assets but also in new assets. A deficit unit in Gurley and Shaw terminology emits financial liabilities, new or used, which are acquired by surplus or portfolio changing units. It was argued that two things occur during sustained growth: 1) the value of equity assets in the various portfolios changes to reflect the expectation that growth will continue; 2) the deficit units have to finance an increasing portion of their activity by debt instruments of the type acceptable to financial intermediaries.

In this chapter we will see how this evolutionary process affects the possibility of financial distress or financial crisis occurring. Our next problem is to trace the money flows that are generated not only by balance sheet relations but also by income and portfolio transactions.

C. Money Flows

In the act of fulfilling the commitments stated in debt instruments, flows of money which we call money flows on balance sheet account, take place. The paying unit has to arrange to be in possession of sufficient money to meet its obligations at the time they are due, or when demanded, or when a specified contingency arises. The receiving unit will also have financial commitments and typically will make its payment plans on the basis of the money it expects to receive on balance sheet as well as on other accounts.

⁷Note that we apparently shifted our ground so that portfolio transactions include transactions involving the sale of existing real assets. This is in order to have the least possible number of transaction types. Obviously a finer breakdown of transaction types than will be discussed in the next section is possible.

In addition to the money flows set up by the existing structure of issuers and owners of financial assets (both debts and equities) money flows result from current income-producing activities and portfolio changes. Income-producing activities result in money being exchanged for goods and services. Note that the imputed services, such as capital consumption allowances, do not result in any payments between elementary units and hence do not appear among the money flows due to income-producing activities. It is a matter of research strategy whether all interfirm payments or only those related to the purchase of final goods and services — the production of gross national product — should be included. Portfolio changes result in money being exchanged for either existing assets (tangible and intangible) and newly created financial assets. The creation of new tangible assets (gross investment) and the destruction of inherited tangible assets (capital consumption) are not included among the portfolio transactions. Hence, since balance sheets contain tangible assets, initial balance sheets plus portfolio changes will not yield final balance sheets.

This division of money flows into three transaction types — those due to balance sheet account, income account, and portfolio account — is useful analytically because it sets out quite precisely some of the financial constraints within which any economic unit functions and defines the circumstances which make a sharp drop in asset values possible. It is also useful because it divides money flows such that behavioral relations for the various flows classified by accounts can be postulated. If the data are available, these behavioral relations can be estimated, and once estimated they can be integrated into aggregate models of income determination.⁸

Once transactions types for money flows are specified, a money payments square matrix for each transaction type can be defined. The number of rows and columns in the matrix depends upon the number of transactors into which the economy is sectorized. As money flow analysis focuses upon the significance of financial institutions in determining the behavior of the economy, the sector-

⁸The money flows defined here and used as the basis of our analysis are not the same as the money flows given by the Federal Reserve System of accounts. It is a problem beyond the scope of this study to discover whether the Federal Reserve's money flows can be transformed into the set of flow matrices that will be described in this chapter.

The Federal Reserve's approach to money flows seems to be directed toward examining how investment is financed and how the balance sheet structure changes. The approach adopted here is directed toward the integration of the process by which income is determined with financial relations and practices.

ing for the matrices will include a number of classes of financial institutions, as well as governmental and private income-producing and receiving sectors.

Conceptually, money flows due to current income-producing activities include payments for final goods and services and human factors as well as for intermediate goods which are sold by one firm to another for use in current production. Aside from the payments for investment goods, our analysis will not consider money flows due to the input-output relations within the business sector; rather we restrict our attention to the income account money flows that are related to final output.⁹ It is necessary to emphasize that these money flows on income account do not include contractual dated payments of interest, rent, etc. and the payment of dividends which are a part of personal income in the national income accounts. For such payments are reflections of balance sheet and other contractual obligations.¹⁰

Three classes of money flows result in balance sheet changes and are classified as portfolio transactions. These are money flows in exchange for existing real assets, existing financial assets and newly created financial assets. The money flows due to the transfer of titles to existing real assets do not particularly concern us as long as our emphasis is upon financial crises. A financial crisis will be well advanced before such transfers take place for liquidity purposes, and transfers of titles to existing real assets for production function and consumption purposes are outside the main stream of our concern,¹¹ although because of their potential

⁹It is quite clear that the analysis put forth here would tend toward a "Fisherish" concept of transaction velocity rather than a "Marshallian" income or income and wealth velocity. As a result the firm business to business payments of input-output analysis should be included in any money flows accounting system. If this is done then the gross debits to demand deposits will be useful as a control over the totals in the matrices.

¹⁰The classification of dividends as balance sheet rather than income payments is mainly due to the somewhat sticky behavior of dividends as income changes. Once again this is a decision based upon the desire to keep the number of payments classes to the minimum needed for our analysis.

¹¹It may be unwise to pay absolutely no attention to such transfer of titles to existing non-real estate type tangible assets. The following observation indicates that the price and availability of existing assets may be a determinant of income-producing activity. The price of a used car of any vintage relative to the price of a new car is a determinant of the cash payment of financial commitment that (Continued on the following page.)

importance in financial crises real estate type assets are integrated with financial assets in what follows.

Transfers of existing financial assets change the structure of interrelated balance sheets and affect the future dated stream of money flows and the obligations on contingent liabilities. A unit, by such portfolio changes, can adjust the stream of money payments others are obligated to make to it and the conditions under which payments will be made. The "to whom" of a money payment commitment by an economic unit can be changed by such transactions. By refunding operations, which really involve transactions in both new and existing financial assets, a unit can change the time schedule of its money payments.

The exchange of money for newly created financial assets includes not only the issuance of new bonds, mortgages, common stock, etc., but also the creation of money by banks and the creation of deposits in various nonbank financial intermediaries. The exchange of money for newly created real assets is an important part of the income flow, and, although a large part of the flow takes place within the business sector, we will pull it out of the business transactions we are going to ignore and include it in our analysis.

Hence the money flowing to any economic unit during any period of time can be separated into three streams. These are money flows due to

- a) the unit's participation in the production of current income,
- b) its ownership of the financial obligations of other units,

(Footnote 11, continued from the previous page.)

a new car buyer must make. A relatively large stock of used cars in the hands of dealers and the resultant relatively low price for such cars is usually a harbinger of poor new car sales.

As an example of how the market price of real estate type assets affects the economy:

- 1) the protection behind mortgages owned by financial institutions and other units depends upon the price of existing assets;
- 2) the decision between buying a newly produced house or buying an existing house also depends upon the price of the stock. The decision will tend to be in favor of buying an existing house if during a recession the price level of property is more flexible than the price level of labor and materials, so that the used house becomes a relatively better buy. The lower interest rate together with the preferential terms usually available on new houses may offset the movement in relative price during mild recessions.

c) its sale of assets, and its issuance of new liabilities (this includes the creating of deposit liabilities by nonmonetary financial institutions).

Similarly the money flowing from any economic unit during any period of time can be separated into three streams. These are money flows due to

- a) its current income activities,
- b) its existing financial liabilities,
- c) its purchase of existing financial assets and of new financial assets, which includes the acquisition of a newly created deposit in a savings intermediary.¹²

As far as money flows from an economic unit are concerned the two types of portfolio flows are basically the same and usually are not worth distinguishing except for the impact of the flows in exchange for new liabilities of financial intermediaries.

If we consider a three-way division of private economic units — households, ordinary business firms, and financial institutions — these three types of money flows are not of equal importance to the various classes of private economic units.

Over any period of time there is no need for the money flows to and the money flows from any unit to be equal. However, aside from units in the monetary sector, the cash balance of a unit at any date sets the maximum amount by which the sum of its money payments can exceed the sum of its money receipts from that date on. One of the determinants of the behavior of any private economic unit is the need to satisfy this "cash box" condition.

Earlier we classified financial liabilities into debts and equities and divided the debts into dated, demand, and contingent debts. To the dated debts we can add the payments commitments which do not appear on the balance sheet to derive a known dated stream of money flows from any unit based upon current obligations. Due to its ownership of various debts and other contracts, there also exists a known dated stream of money flows to the unit which are based upon the existing portfolio and non-balance sheet contractual commitments. This financial asset and liability determined set of money

¹²A money creating transaction by the monetary system has to be interpreted as a flow of money from the monetary system to the borrowing or selling units. Hence an increase in the money supply represents a flow of money "from" and a reduction in the money supply is a flow of money "to" the monetary system.

flows can be changed by portfolio changes. Nevertheless the existing set of balance sheets with the money flows it determines, constrains the activities of economic units on income and portfolio account. During any period, a unit must so choose its current operations on income and portfolio account so as to be able to meet the commitments due to its balance sheet position.

No economic unit wants to be in a position where an exact synchronization of money flows to it with the required money flows from it is necessary if it is to fulfill its obligations. It will therefore plan to have a reservoir of money, a cash position which will enable it to overcome at least some interruptions in the flow of money receipts. In addition to the cash position, an economic unit will protect its ability to make some payments, even if the money flows to it are interrupted to not too great an extent, by owning some assets which are easily turned into money. These assets include nonmonetary demand liabilities and some types of dated debts.

In addition to the dated debts, the current balance sheets include demand and contingent debts. Any unit with such debts outstanding must make some provision for these debts becoming current at an embarrassing time. Of course a large portion of the contingent liabilities — such as those of insurance companies — are expected to become current according to some quite stable schedule, but others, such as *de facto* demand deposits in savings institutions may become current as the result of some triggering event. Such unexpected pressure from contingent liabilities and demand liabilities due to some triggering event has been a not unusual occurrence. Any prudent unit with a large volume of contingent and demand liabilities must make some prior provision for refinancing its position or selling (or pledging) its assets in the event it is faced with an unusual need to make payments. The striking weakness of the pre-1929 call money stock market was that the borrowers on all had no alternative source of financing to turn to if the loans were called. After the event we know that this was not prudent.

The various streams of money flows as determined by balance sheet relations, income transactions, and portfolio transactions are not independent of each other. Aside from the fact that in a closed economy the sum of money flows to all units must equal the sum of money flows from all units, the behavior of any economic unit with regard to any one type of money flow is not independent of the requirements put upon it by the other money flows to or from that will occur. For example, money flows to an economic unit on portfolio account may be related to balance sheet determined money flows from the unit.

In this paper no attempt is made to set out and operate with a complete model of money flows. However a sketch of the relations

determining some of the money flows to and from each of three classes of private economic units — households, ordinary business firms, and financial intermediaries — and the public sector — the federal government — will be undertaken. This will be done in order to get some idea of how balance sheet structures constrain economic activity, how they are affected by a sustained boom, and under what circumstances and upon what type of economic units the financial pressures that can lead to financial distress or crisis may occur.

It is recognized that the level of aggregation used when all economic units within an economy are classified as either households, business firms, financial institutions or the government is too high for an analysis of most of the problems of financial stability. Certainly for almost all purposes, the financial institutions sector must be considered as being made up of at least three classes (the monetary system, the savings intermediaries, and the money market intermediaries), and for many purposes even this level of aggregation is too high. Also state and local governments should be considered as types of units different from the national state. Perhaps state and local governments are best considered as a type of private business rather than as a "government."

For each type of money flow (income, balance sheet, and portfolio account) a source and destination square matrix can be set up. Working with four classes of economic units, and three types of money flows, a description of the flow of money over any period of time is contained in three four-by-four matrices. A model of money flows consists of the relations which determine the elements of these matrices.

In addition to the problems involved in the aggregation to classes of economic units, there are problems involved in selecting the number of different types of money flows that are to be distinguished. In dealing with problems of financial stability, it is necessary to distinguish between the dated, demand and contingent balance sheet items. In dealing with portfolio changes it is necessary to distinguish between operations involving new assets and operations involving existing financial and tangible assets.

Deposits and withdrawals in savings institutions create and destroy financial assets, and it is a question whether these transactions are best treated as balance sheet or portfolio transactions. It seems best to treat the deposits into the financial institutions as portfolio transactions involving the creation of new securities and the withdrawals of deposits as balance sheet transactions equivalent to repayments on existing dated securities which become due during the money flow period being examined.

Regardless of how these transactions are treated, the existence of balance sheets with dated, demand and contingent liabilities is

of utmost significance for studying the problems of financial stability. In part it is by the exercise of the demand options and the occurrence of the specified contingencies that financial embarrassment can deteriorate into financial distress and crisis. It is necessary to identify what factors determine the extent to which such destabilizing options are exercised or such contingencies are satisfied.

In spite of the difficulties of aggregating to very few classes of units and types of flows we will work with four classes of economic units and three types of flows to and from each class of units. We can do this because our aim is very modest: to indicate what types of money flow relations exist and what the determinants of these flows may be. In Chart II-1 a diagram showing some selected types of money flows among classes of economic units is exhibited.

1. Households.

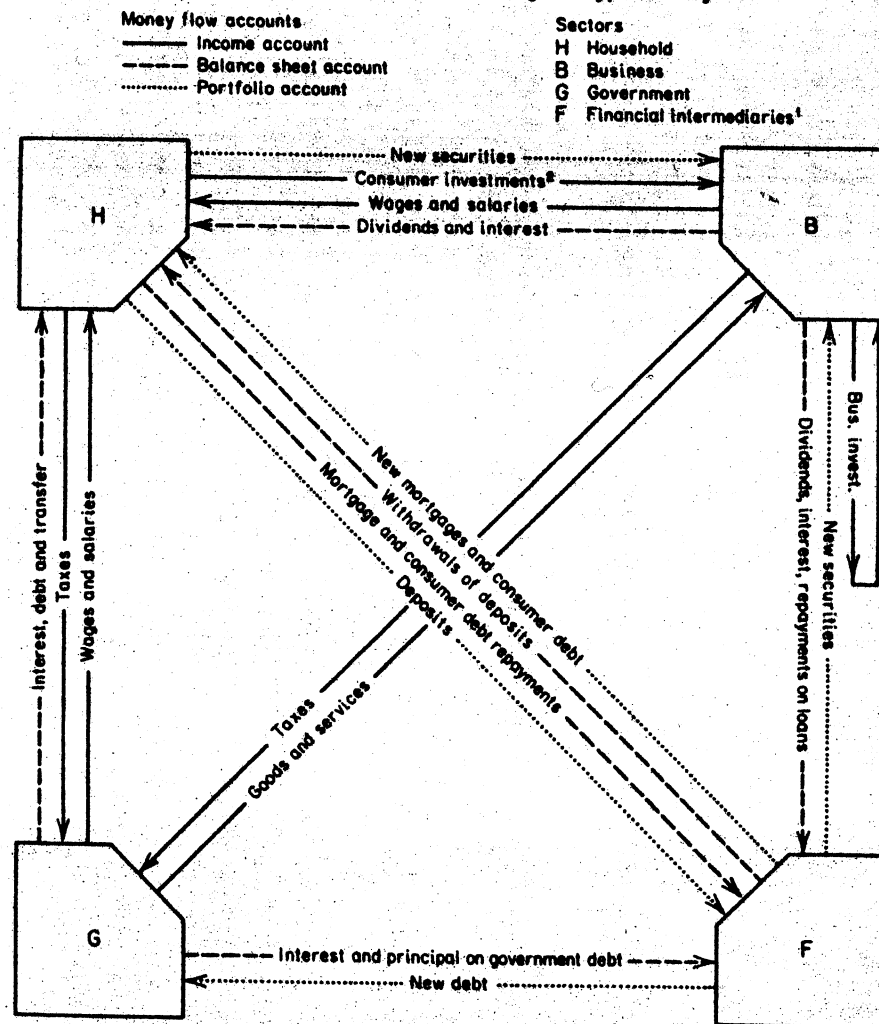
a. Income account. The flow of money to households on income account consists of wages and salary payments actually made. Household receipts of interest and dividends are the result of the balance sheet structure as are transfer payments to households from the government. Because of the absence of interest and dividend receipts and tax payments from this item it is much more sensitive to changes in national income than either personal or disposable income.

Households payments on income account are derived from current consumption, direct investment by household and direct taxes. These payments include the total payments for newly produced consumer durables and "household owned" houses. These different types of household income account payments will not depend in the same manner upon a common set of variables. The variables in the behavior relations will include household receipts on income and balance sheet accounts, household payments on balance sheet accounts and the terms on which household debt can be issued. Obviously with favorable terms for the flotation of household debts, household payments on income account can exceed household receipts on income and balance sheet accounts.

b. Balance sheet account. The flow of money to households on balance sheet account includes items such as interest and dividend receipts from the other classes of units which would typically be included as a part of the income receipts in national income accounting. Since government liabilities on unemployment insurance, social security, etc. are treated as contingent balance sheet items as are the government agency liabilities on deposit and mortgage insurance), such transfer payments to households are also included

CHART II-1

Selected Money Flows Among Sectors Money Flows Classified According to Type of Payment



¹ The relatively minor income payments and receipts of financial intermediaries are ignored.

² Includes total expenditures on new houses and consumer's durables.

as balance sheet receipts. Hence a part of the receipts on balance sheet account is sensitive to employment and reacts to maintain "disposable income."

In addition, money flows to households due to the arrival of the due date on the repayment of the principal of dated commitments are a part of balance sheet receipts; hence balance sheet receipts include "capital" as well as "income" transactions.

Another part of the flow of money to households on balance sheet account is the flow of money which is due to the exercise by households of demand options. Withdrawals from savings accounts of various types would be examples of this type of flow.

It is obvious that in any model building it will be necessary to separate household receipts on balance sheet account into household receipts on these various different types of contracts. It is also obvious that some of the household receipts on balance sheet account will be sensitive to unemployment and that the potential for financial distress for a significant class of financial intermediaries rests upon the sensitivity of household withdrawals from deposit accounts to levels and changes in the level of income.

The flow of money from households on balance sheet account includes the interest and principal payments on outstanding mortgages and consumer installment credit. The largest portion of these payments are to financial intermediaries. The sensitivity of default rates to changes in income will be an indication of whether a decline in income will affect some financial intermediaries both on the receipts and payments sides. The extent of the pressure upon financial intermediaries that can result from a decline in income is a determinant of whether changes in income, by affecting money flows, can affect the stability of the financial system.

c. Portfolio account. Receipts of households on portfolio account includes receipts due to the sale of existing tangible assets, existing financial assets and the creation of new financial liabilities by households. These items obviously are money flows which are due to current decisions, although sales of assets and emission of new liabilities are among the ways in which cash deficits on income and balance sheet accounts can be offset. The most important new liabilities households can emit are new mortgages and consumer debt and, as mentioned earlier, to a considerable extent the receipts by households on these accounts determine some of the payments that households make on income account.

For the purposes of this paper an important household payment on portfolio account is the depositing of funds in various types of savings intermediaries which create deposits and other liquid

assets. In addition household payments on new and existing financial assets other than deposits are significant money flows on portfolio account.

Before going on to look at some of the money flows of business firms, it is interesting to summarize some of the ways in which household money flows are related to savings intermediaries money flows. Household payments to savings intermediaries take the form of deposits and payments on mortgage and installment credit. Household receipts from these institutions take the form of withdrawals from accounts and receipts in exchange for newly issued mortgages and consumer installment contracts. If household deposits fall, defaults rise, and withdrawals rise when income falls, then these financial intermediaries either will have to reduce their payments to households on newly issued mortgages and consumer installment contracts or find some alternative source of cash. This in turn will lower the income payments by households — which can further lower income and cause further pressure on the financial institutions involved.

2. Business Firms

a. Income account. We ignore the input-output type of relations among business firms and the payments associated with these production interrelations. Business firm receipts on income account are due to the sale of consumers' and investors' goods and services. Business firm payments on income account are for wages and salaries; gross investment and business direct and indirect taxes. The interesting business payment is the gross investment payment, and any model designed to explain money flows must contain a relation that explains this flow.

b. Balance sheet account. Aside from trade credit, receipts on balance sheet account usually are not significant for business firms. Payments on balance sheet account by ordinary firms consist of interest and principal on debts and dividends on equities. The ability of business firms to make these contractual payments depends mainly upon the difference between receipts from final sales and wages, salary and tax payments. These in turn depend upon final demand.

c. Portfolio account. Business firm receipts on portfolio account include receipts from bank borrowings and the sale of new securities to other types of units. In addition from time to time business firms have acquired large holdings of government securities which later were sold off for cash which was used to finance expenditures.

Aside from operations in the government security market and other short-term money markets business firms payments on portfolio account are not significant.

For completeness we should include trade credit, by which some business firms finance other business firms. The creation of the liability which is a business — business portfolio transaction — accompanies a flow of goods or services rather than money, and results in a balance sheet position that can be an important determinant of the future behavior of the borrowing and the lending unit.

3. Financial Institutions

Our special interest in this paper is to examine the conditions under which financial distress or crisis can occur. Since widespread financial distress or a financial crisis is most unlikely to occur unaccompanied by financial distress for at least some financial institutions, we are particularly interested in the money flows to and from these economic units.

It is necessary to distinguish between the monetary system and other financial institutions. As far as the monetary system is concerned the most interesting transactions are those which change the quantity of money. The quantity of money is increased when the monetary system acquires assets and pays for them with newly created money. This transaction is equivalent to a payment on portfolio account by households or business firms. Similarly a decline in the quantity of money is associated with a decrease in assets of the monetary system. However this decrease of assets may take the form of a sale of investments or a decrease in loans. In the "ancient" days when financial crises were associated with commercial banks' need to acquire "reserve money," the decrease in bank loans often meant that business firms were unable to refinance a position. This meant that business firms as a class were not able to do what they "normally" did — issue new debt to banks to acquire funds with which to repay maturing debt. The maturing bank debt represented a dated balance sheet account money flow from business to the banks. The new debt would be represented by a portfolio account money flow. As result of being unable to refinance their position, the business firms only recourse was to attempt to decrease their position — to sell their assets, or at least no longer accumulate assets. These attempts adversely affect asset values, increase money flows on portfolio account, and decrease purchase by firms from firms on income account.

In the examples of money flows to and from financial institutions that follow, the money flows of the monetary system will be ignored.

a. Income account. Basically the income account is not very significant for financial institutions. They receive money on income account due to current services such as brokerage, underwriting, and current insurance that they provide. Their payments on income account are of course their wages and salary bill.

b. Balance sheet account. The money flows to financial intermediaries on balance sheet account include both interest and principal payments on the debts they own. These flows come from households, business firms, and governments. Payments on balance sheet account include the withdrawals from savings intermediaries by households, as well as interest payments by financial intermediaries.

c. Portfolio account. Money flows to financial intermediaries on portfolio account occur as they either issue their own debt instruments or sell their earning assets. Hence a major flow toward financial intermediaries on portfolio account centers around the new nonmonetary deposits some of them create. An important part of the flow of money due to the sale of earning assets by a financial intermediary is the result of transfers to other financial intermediaries. Such within the class transfers are always important for the liquidity of particular units. Guaranteed markets for their earning assets or their own debts is of course necessary if any particular class of financial intermediary is to be protected against a serious crisis. In this respect the conditions under which a particular class of financial institutions can tap the central bank is an important determinant of their vulnerability to financial pressures.

Money flows on portfolio account from financial intermediaries as a result of their purchase of newly created debt instruments from households, business firms, and governments as well as a result of their purchases of existing financial assets from these units.

4. Government

a. Income account. Government receipts on income account are the result of taxes; their payments on income account are for wages, salaries, goods, and services.

b. Balance sheet account. Government receipts on balance sheet account are trivial if they exist; their payments on balance sheet account include the interest and principal on government debt and all the transfer payments. There is of course an asymmetry here: the receipts for the protection the government provides are considered as payments and receipts on income account whereas the payments the government makes are considered to be part of the balance sheet flow. The reason for doing this is that the liability for taxes on social security, etc. account is related to household and business income and the household is not acquiring a marketable or even a personal asset as a result. What the household will receive is determined by law. On the other hand at any particular time an element in the decision process of households, business firms, and financial institutions is the fact that under specified contingencies government transfer payments or government insurance guarantees will become operative. These items are "contingent

assets" of the decision-making units, they are contingent liabilities of the various government agencies.

c. Portfolio account. The receipts of government on portfolio account are due to net increases in the government debt outstanding. There are no significant government payments on portfolio account.

D. The Evolution of Balance Sheets and Money Flows

During a sustained boom in which the driving factors are private household and business investment, the increase in money income between any two periods depends upon either the creation of new money or a substitution of debts (and possibly equities) for money, i.e., by a velocity change. The debts which are substituted for money in the portfolios of households and business firms can be either the debts of financial intermediaries or the debts of the government which are "sold off" by financial intermediaries in order to acquire the debt of the investing unit.

A privately generated sustained boom is associated with a change in the significance of financial intermediation. This may take the form of a change in the composition of the assets owned by financial intermediaries even if there is no relative increase in the volume of their liabilities outstanding. In the absence of inflation, business and household debts grow relative to income and interest rates rise during a sustained boom; this means that an increased portion of the receipts of business firms and households are committed to the servicing of liabilities and the private balance sheet money flows increase relative to the income account money flows.

Another financial aspect of a sustained boom deals with the increase in the prices of financial and real estate type tangible assets which takes place. As a result of capital gains (both realized and unrealized), the net worth of households rises relative to household's income and balance sheet receipts. As a result there is an increased willingness and ability of consuming units which own equity and real estate type assets to debt-finance household expenditures. Hence as a sustained boom is prolonged an increase in luxury consumption and household investment will take place. This is an expansionary factor, and the rise in the ratio of household expenditures to income that this induces tends both to sustain the boom and decrease the ratio of investment to income.

Business firms will also own property which has appreciated in value; this will be especially noticeable for commercial property. As a result of the workings of the tax laws and of traditional accounting practices it is to the advantage of these firms to sell such property and realize capital gains. By realizing capital gains, the firm's equity accounts are increased, which will, if it chooses, enable the

to support more debt. The purchasing unit may issue debt (mortgages), using the purchase price as the base, to finance the acquisition. In this way owners' equity, property values and the size of debts will reflect the expectation that growth will continue. In addition to the prices of equities and real estate type assets reflecting the capitalization of growth prospects, as a boom is prolonged, debts will reflect this same capitalization.

When this type of revaluation of assets and the debt financing of the acquisition of these now higher priced assets is well advanced, the financial structure is vulnerable on two scores to a decrease of asset prices if the expectation of growth is "abandoned." First and most obvious is that the value of equity and real estate type assets will decrease. Second and equally important, this decrease in the value of these assets will lower and in many cases even wipe out the protection that the lender had when he made the loan, the protection that is due to the difference between the market value of the asset and the loan. The protection of the lender can also be imputed to the net worth of the borrower. The decreased value of the equity or real estate type asset can, by making the market price of this asset less than the amount of the outstanding loan, affect the net worth of the lending institution.

The desire to realize capital gains and to acquire assets which can be financed on favorable terms and which may appreciate will lead to increased trading activity in existing tangible and financial assets. Transactions on portfolio account, especially within the sectors, by dealing in existing tangible assets as well as financial assets, will increase relative to income and balance sheet flows.

Once capital gains in real estate become "expected" then the development and construction of real property can be undertaken in order to take advantage of such opportunities for capital gains. An investment boom in real estate can occur, which will sustain the growth process. But a boom based upon extrapolation of existing rates of change of asset prices can result in the construction of more of such assets than current demand can use. As a result the boom in time can lead to an oversupply which in time will tend to lower asset values. The problem of financial stability is to arrange things so that, whatever decreases in asset values take place, this decrease will remain isolated.

Hence systematic changes in the financial structure take place during a sustained boom. The "balance sheet" money flows increase relative to income. The value of equity and real estate assets rise relative to the current income imputed to them. The money flows on portfolio account increase relative to the money flows on balance sheet and income account. (Transaction velocity increases relative to income velocity.) As a result of the need to finance

private investment by debts and the increase in the market price of equity and real estate assets, the ratio in the economy of risk assets to assets basically free of risk increases.

The rise in the ratio of debts of private units to income that takes place does so by increasing the "layering" of debts in the economy; the structure of financial intermediation becomes more complex. The financing of investment by increasing velocity increasingly takes the form of specialized institutions "borrowing short" to "invest long." The growth and expansion of such financial institutions increases during a sustained boom. In terms of what will be taken up in Chapter VII there is an increase in the number of institutions and the proportion of assets that should, because of the nature of their balance sheets, have access to the central bank.

In general, during a sustained boom the financial system so evolves that it becomes increasingly likely that a slight decrease in income, of the type that occurs from time to time during a sustained boom, will lead to rather large financial reactions. When a response is in some sense disproportionate to the stimuli then a system is unstable. Early in a sustained boom, before the financial system has evolved, slight decreases in income do not result in a large financial reaction. The evolution of the financial system during a sustained boom is from being a stable to being an unstable system.

E. Financial Distress and Financial Crisis

1. Introduction and Definitions. Up to this point we have used the terms financial difficulty, financial distress, financial crisis, and financial instability without defining them and without being precise. We will now define each of these terms and specify the class of units to which they refer.

We will use the term financial difficulty as a generic term which includes both financial distress and financial crisis. Financial distress will refer to the financial difficulties of an economic unit, and financial crisis will refer to a situation where all or a very significant segment of the economy is in financial distress. Financial instability will refer to a situation where a slight disturbance in the money flows can lead to sufficiently widespread financial distress so that a financial crisis can result.

Our first problem is to define financial distress. An economic unit, be it a household, firm, financial institution or "government" is in financial distress anytime it does not have sufficient money on hand and in sight to make the money flows it is committed to originate during the succeeding short period. Often this situation will arise because the unit is unable to fulfill the commitments stated on its balance sheet liabilities (including endorsement, demand, and

rental contracts). However, since a lag between an income transaction, such as the use of labor or the receipt of goods, and the money flow to pay for the good or service is usual, financial distress can arise on income account, i.e., money flow "commitments" due to "recent" income transactions cannot be honored. Of course this category of events could be handled by transforming the debt on the income transaction into a balance sheet liability, so that financial distress occurs only when an economic unit cannot meet its commitment to originate money flows as stated in its balance sheet liabilities. We will not adopt this artifice; rather we will consider that losses on current income for business or too much "spending" by households can yield financial distress on what we will call income account.¹³

It is important to note that financial distress cannot be due to equity liabilities. No matter how regularized dividend payments may have become, no penalty, aside from a decrease in the market value of the liability and the possibility that management may suffer from the ire of stockholders, results from a business firm's missing a dividend. Also, if an economic unit has "signed" a contract to pay life insurance premiums or make regular deposits into a savings account, the unit is not necessarily in financial distress when it is unable to make payments on these contracts. Once again it is a question of the penalty for not making the payment, and in these cases the penalty is slight or nonexistent.

Financial distress for an economic unit cannot arise because of a portfolio transaction, for, in our language, portfolio purchases are always the result of current decisions and we do not allow for any lag between this decision and the payment as we did for income account transactions.¹⁴ The only reason for this asymmetry is that it corresponds to the way in which we read the world.

It must be made very clear that financial distress refers to money flows from a unit. A unit can be placed in financial distress when there is some "unforeseen" element in money flows to a unit. A decline in the market value of assets may result in money flows

¹³A unit may be in temporary financial distress, that is, there are certain money flows to the unit over a somewhat longer time span which will enable the unit to meet its obligations. In this case the creditors, or other units, may refinance the unit and the more serious penalties associated with financial distress will not be applicable.

¹⁴Dated commitments to purchase an asset can be a cause of financial distress: however in our classification the dated commitment to engage in a portfolio transaction is a balance sheet liability.

to a unit on portfolio account being smaller than had been expected. In this way portfolio receipts may result in the unit's being unable to meet money flows due to balance sheet or income commitments. The examination of the relation between money flows to a unit and financial distress will be our concern in the next section.

Hence we have that an economic unit is in financial distress when it cannot meet its obligations in its balance sheet liabilities and some penalty, considered to be serious, is attached to such default. The penalties for default which are considered serious have quite a wide range. Among the penalties are (1) loss of reputation, (2) impairment of the ability of the defaulting unit to issue debt in the future, and (3) various legal recourses against the defaulting unit including repossession, forced sales, and bankruptcy. Hence for our purposes we can assume that every economic unit tries to avoid being in financial distress and will do "all that is within its power" to avoid this situation.

An economic unit can avoid the possibility of financial distress by never signing a contract to make payments in the future and by never spending without having the cash on hand with which to make payments. This implies that the unit has such fear of financial distress that it does not take advantage of apparently safe financing opportunities. Such units can be called absolute risk averters.¹⁵

We will not include within the phrase "doing all that is within its power to avoid financial distress" that the economic unit does not engage in the type of activity which leaves it vulnerable to financial distress. Hence debt financing, the making of payment commitments which require uninterrupted money flows to the unit, and other activities which include the possibility of financial distress will take place. What we assert is that given that a unit makes such contracts it will conscientiously try to fulfill them.

We have defined a financial crisis as a situation in which "all or a very significant subset of the economy is in financial distress." The phrase "all or a very significant subset of the economy" is, as it stands, imprecise. Of course we could speak of a financial crisis within a precisely defined subset of all economic units; for example all Government bond dealers, all owners of a corporation's stock, all employees of Y city, etc. This usage has considerable merit, for localized financial crises can occur.

However we want to be able to speak of a financial crisis within the economy as a whole. If we add to our definition a phrase to

¹⁵See J. Tobin, "Liquidity Preference as Behavior Toward Risk," *op. cit.*

the effect that a trend in the number of economic units in financial distress is evident so that, unless some compensatory action takes place, soon all units will be in financial distress, the lack of precision in our definition of financial crisis is removed. This modification will also enable us to consider situations in which central bank or government action prevents widespread financial distress from becoming a financial crisis. Hence our definition of a financial crisis is:

A financial crisis exists when a very significant subset of the economy is in financial distress and a trend is evident so that unless some "outside" event takes place soon almost all private economic units will be in financial "distress."

Financial instability exists when "a slight disturbance" in money flows will result in such widespread financial distress that a financial crisis is threatened. As will become evident in what follows, an economic unit in financial distress results in financial losses to other units. These financial losses can result in the other units becoming distressed. Hence an interruption in the flow of money from a unit can result in additional interruptions in the flow of money. There is no need for such a "wave" of financial distress once started to become generalized. However it is possible for the financial and money flow interrelations to be so delicately poised that the slightest interruption of money flows can result in generalized financial distress. On the other hand it is possible for a financial structure to be stable with respect to a given extent of financial distress and unstable with respect to a greater extent of financial distress.

A more precise definition of financial instability would be that:

Financial instability with respect to a given extent of financial distress exists whenever financial distress of this given extent or greater results in a financial crisis. The extent of financial distress refers to the number and distribution of the units that are in financial distress. If the extent of financial distress is below the critical level, then the endogenous phenomena by which one unit in distress affects other units will not lead to a financial crisis. If the extent of financial distress is above the critical level, then no further outside shocks are necessary for the financial system to generate a financial crisis.

It is obvious that when we argued earlier, in general terms, that the financial system evolves during growth so that it becomes less stable, we meant that the extent of financial distress necessary for an internally generated financial crisis (internal to the financial system) decreases as the sustained growth process proceeds. Hence a given size external shock, which would not generate a financial crisis in the early stages of a period of sustained growth, is sufficient to generate a financial crisis at a later date.

In addition to the terms financial difficulty, financial distress, financial crisis, and financial instability we will use the term financial losses to cover situations in which a receipt due on balance sheet account is not forthcoming or an asset a unit owns decreases market value.

We will first examine how an economic unit is placed in financial stress. This examination will be carried on in two steps; we will first examine the ways in which any unit can be placed in financial stress and then we will examine the applicability of these ways to households, firms, and financial institutions.

In the following section we will examine how financial distress can be generalized. This has two aspects: the effect of an outside change on the individual units and the effect of the financial distress on a unit or set of units upon the financial situation of other units. It is then argued that a financial crisis will occur when financial stress of one unit adversely affects the financial stability of other units and that the path by which financial distress generates a financial crisis involves the effect upon the value of financial and real assets of a generalized attempt to meet financial commitments by portfolio sales.

After examining how financial distress can be generalized into financial crisis, we will be in a position to describe the attributes of a stable and unstable financial system. We can then return to the basic question of how the very process by which privately driven economic growth is financed transforms a stable financial system, with respect to a given extent of financial distress, into an unstable financial system, with respect to the same extent of financial distress.

2. How an Economic Unit is Placed in Financial Distress.

a. General discussion. How is it that an economic unit is placed in a situation where it does not have sufficient money on hand to fill its currently due commitments and there is no good prospect that it will be able to fulfill these obligations in the "near" future? The various ways in which an economic unit can be placed in financial stress can be distinguished:

- (1) The unit may have made losses on income account.
- (2) Other units may have defaulted on money due it on balance sheet (or income) account.
- (3) The market value of its assets may have declined.
- (4) An increase in its current liabilities may have taken place without an equivalent increase in its current assets (i.e., a contingent liability became current).

(5) An unusual or unexpected exercise of demand options by the owners of such contracts may arise.

The first way in which a unit can be placed in financial distress reflects either a deficiency in the money flow to the unit or an excess in the money flow from a unit or both. The second and third ways in which a unit can be placed in financial distress reflect interruptions or "short falls" in money flowing to a unit. The last two ways in which a unit can be placed in financial distress refer to increases in the currently due balance sheet money flows from the unit.

In textbooks on money and banking it is usual to distinguish between liquidity defined as the ability to make payments when due and solvency defined as the unit's having a positive net worth. These banking ideas are applicable to all classes of economic units. Our definition of financial distress has emphasized the illiquidity aspect of a unit's financial problems, however, by excluding "temporary" financial distress we have apparently excluded the cases where the unit is solvent. For if the unit is solvent, that is, if it has a positive net worth, then by selling its assets it could fulfill its commitments to make payments; hence in a perfect capital market its distress will be temporary. The only exception is if there is a significant difference between the price that some assets, real or financial, can fetch in an orderly sale and the price they can fetch in a hurried or forced sale. The money and capital markets would charge a large risk premium for financing this unit. In such a case a unit may be in financial distress and both creditors and debtors may choose an orderly liquidation of the unit rather than a hurried liquidation. In these circumstances a unit may be in financial distress in the sense that it cannot meet its commitment "soon," but as orderly liquidation proceeds it may turn out that the unit had a positive net worth.

We will now explain more closely the various ways in which a unit can be placed in financial distress and examine how each of these ways applies to the different private classes of economic units. Of course the government, considered as a national state, can never be in financial distress as long as we restrict our attention to domestic financial relations. This is assuming that we have a smoothly working modern banking system and the central bank has no "private" veto over government policies. With a primitive monetary system or with a truly independent central bank the national government could find itself unable to meet its commitments and unable to create money to get out of this embarrassing position. We will assume that this cannot happen in the modern world.

We will also ignore the more realistic possibility of financial distress for state and local government. It may be that situations

which municipalities and states default in their obligations will rise from time to time, but we will quite arbitrarily assume that the federal government will support state and local governments to the extent that it is necessary to prevent their financial distress.

b. Losses on income account. This path to financial distress related to the profit and loss statement of an economic unit. Assume the balance sheet assets and liabilities and the money flows required by them are given. The balance sheet money flows yields a set of minimum income account receipts and expenditures the unit must satisfy if it is not to finance a deficiency in money receipts by engaging in portfolio transactions. For any given amount of income account receipts there is a maximum amount of income account expenditures which the unit can make without being required to engage in portfolio transactions, and symmetrically for each amount of income expenditures there is a minimum amount of income receipts for the unit not to be forced to finance its money flows by portfolio transactions.

A unit which has to finance its money flows by portfolio transactions may either issue liabilities or dispose of assets. Both of these processes have limits; either the acceptability of its liabilities decreases or it runs out of assets.

There is an exception to the proposition that a unit's liabilities may lose their acceptability: if a unit is investing, the increase in assets and in future earning power due to the income payments on the investments may be sufficiently great to result in the acceptability of its liabilities' being undiminished by the increase in their amount. For a typical going concern which is investing, if the investment expenditures were "segregated" it would not need to finance its expenditures by portfolio transactions.

We will now ignore the financing of investment. Given the balance sheet flows, a unit will have recourse to portfolio transactions to replenish its money supply if its income receipts and expenditures result in a deficiency of money flows. We will call such deficiencies due to income account receipts and expenditure "losses on income account"; they result in a decrease in the net worth of the economic unit. With the possible exception of households whose head is "aged" we can assume that no unit wants to make losses in income account. Losses in income account can be the result of receipts falling short of expectations or expenditures exceeding expectations. Even though a unit is making losses on current income account, as long as it has portfolio assets or the ability to issue debt, we assume it will meet its obligations on its balance sheet liabilities.

Household's consumption expenditures tend not to respond immediately to a decline in household disposable income. A household

whose disposable income has decreased will if necessary finance expenditures in excess of disposable income by portfolio transactions: the sale of marketable assets, increase in debts or withdrawals from deposit accounts. These portfolio sources will be used not only to meet income account payments but also payments on balance sheet account. As long as a household whose income has fallen has "assets" it can be assumed to meet its obligations. Once it exhausts its net worth,¹⁶ the money flows from a household will be restricted to the money flows it receives as current disposable income, which, given the lack of elasticity of household expenditures on some items, will lead households to default on their balance sheet obligations.

Household financial distress on income account follows from the household reaction to a decline in disposable income. Private financial resources are used to supplement disposable income to meet household expenditures on income and balance sheet accounts. Once the private financial resources are exhausted or seriously depleted the household will cut household income expenditure to the level of disposable income and if necessary default on its balance sheet obligations.

Business firms have some rather inelastic components in their expenditures on income account and balance sheet liabilities which impose money flow requirements. A decrease in sales or a rise in costs can lead to losses on income account. Due to depreciation accounts, net losses on income account may be compatible with the unit's receiving sufficiently large cash receipts to finance current cash requirements on income and balance sheet accounts. In the case where the firm is making positive gross profits and negative net profits, presumably the productive capacity and the net worth

¹⁶Two qualifications to the exhaustion of net worth forcing a restriction of households' expenditures to households' current disposable income should be mentioned: households may have non-market, personal sources of financing and a household's expected future income may be so high that it can finance expenditures even though its balance sheet shows a negative net worth. Personal finance loans, in contrast to sales finance loans, may result in a negative net worth for the households. These contracts are based on the assumption that the household's current and expected income will enable it to meet the commitments. Personal finance loans cannot be expected to enable a household with unemployment to finance expenditures during a period in which income is decreasing.

of the business firm are being decreased in order to fulfill the firm's financial obligations.¹⁷

Some nonfinancial business firms have little in the way of financial assets which can be liquidated if the money flow to the unit falls short of the required money flow from the unit. Most of the assets of nonfinancial firms are tangible assets. If the money flows due to sales are insufficient to finance the money flow from the unit on income and balance sheet account, a firm will have to raise cash by selling its financial assets and pledging or selling its tangible assets. The ability of a firm that is making losses to raise cash by selling or pledging its tangible assets can be quite limited, especially to the extent that its tangible assets are special rather than general purpose assets.

Nonfinancial business firms also can have a fairly large debt component in their liabilities. These debt components not only require current "servicing" of money flows from the firm, but they may be "short" term so that "repayment" money flows are also required. If the firm is making net profits and its net worth is increasing, funds to pay off due debt can be obtained by refinancing operations—by issuing new debt. The possibility of doing this decreases as a firm continues to make losses, so that its net worth is decreasing.

There are always firms which are on the "margin," so that a disappointment in its sales will lead to financial distress. Hence a downturn of income will lead to an increase in financial distress. The larger the debt component in firms' balance sheets, the smaller the financial asset component in firms' balance sheets, and the smaller the ratio of net worth to total debts imply that, in a probability sense, the larger will be the number of firms placed in financial distress as the result of a given decrease in national income.

Financial intermediaries cannot easily be forced into financial distress because of income account transactions. Their financial distress problems center around balance sheet flows and portfolio changes.

¹⁷Of course the net profit as shown in a firm's set of books or tax return is not truly indicative of what is happening to its productive capacity or "real" net worth. Given our corporate tax laws, it is to the advantage of a firm to transform net profits into capital gains. We arbitrarily assume that we have a correct set of books so that net losses do result in both a decline in productive capacity (which may be lagged) and a decline in net worth.

States and municipalities can be forced into financial distress because of income receipts declining and expenditures not being flexible. But we have decided to ignore these possibilities, although they were significant in earlier financial crises.

c. Default by other units. An economic unit can be placed in financial distress because of default by other units on money flow commitments. Ignoring the fact that such defaults may be the result of recent, unfunded income transactions, these defaults are the result of balance sheet relations among units. Such defaults of course mean that the issuing unit is in financial distress, and this default on balance sheet obligations is one way in which the financial distress of one unit affects the financial position of another.

Even though no unit is willingly in a situation where a perfect synchronization of money flows to it with money flows from it is required if the unit is to avoid financial distress, for each unit at any given time there is a limit to the defaults it can tolerate and still fulfill its own commitments. If defaults continue and increase, the limit to further tolerable defaults will decrease.

The defaults on balance sheet account can be of servicing charges on contracts not yet due or they can be of the principal amount. In addition each payment on an amortized contract is a payment of both principal and servicing charges. The only real significance of this distinction is that defaults on principal usually are much larger than defaults on running interest payments.

If because of low net incomes corporations cut their dividends, a decrease in the money flows to economic units on balance sheet account takes place. This repercussion of a decline in national income can lead to financial distress on the part of the asset owner. Of course no default by the corporation that cuts its dividend has taken place; however it is a decline in money flows on balance sheet account.

One type of default on balance sheet account is of special importance in the generation of a financial crisis: this is a default by a deposit issuing organization. Even though by law the various savings deposits have a waiting period that can be enforced by the issuing organization, in fact these deposits are demand deposits. If a savings intermediary cannot honor a request for a withdrawal, then a default on balance sheet account has taken place. Although default on balance sheet account of demand deposits was an essential ingredient in past financial crisis, we will assume that such defaults will not be allowed to occur in the future.

Households can be placed in financial distress by a default of money flows due them in a number of different ways. One way is

if the savings intermediaries default — if not “legally” then in fact by exercising their waiting period option. Decreases in dividend payments by corporations by reducing the disposable income of a household may force households to default.

Households are not too large holders of privately issued financial assets other than financial intermediary liabilities and common stock. As a result even though default of mortgages and private bond issues will affect households directly, the main effect of defaults by such units will be indirectly through their effects upon the financial intermediaries.

We ignore the possibility of default by the various governments on their liabilities, although this took place by state and municipal governments in the 1930's.

Business firms hold little in the way of private financial liabilities other than money. Hence aside from the “ancient” type of financial crisis, in which commercial banks were unable to meet their commitments for the transferability of their liabilities, and which we rule out as being unlikely to occur again, there is not much of a chance that business firms will be placed in financial distress because of balance sheet defaults by other units.

Financial intermediaries hold as assets liabilities of households, business firms, other financial intermediaries, and governments. Aside from the various types of investment trusts, the assets of the deposit intermediaries are largely debts. If other units default on their liabilities due to a decline in their income, the reduction in money flows to financial intermediaries may be such as to place some of the financial intermediaries in financial distress. The immediate impact of household defaulting on mortgage and consumer credit paper, on business firm defaulting on mortgages, corporate bonds, and ordinary business loans will largely be on financial intermediaries.

If a significantly large number of financial intermediaries are placed in financial distress, then a further interruption of households' and business firms' ability to pay will take place. For in comparison to the number of economic units that hold the liability of a household or a business firm as an asset, the liabilities of almost all financial intermediaries are widely diffused throughout the economy. Hence the impact of a default by financial intermediaries on their liabilities is particularly widely spread among other units.

One other impact of default by financial intermediaries on households and business firms should be mentioned. The liabilities of most financial intermediaries are considered to be liquid and well-nigh risk free assets by the households and business firms that own

them. Default by a financial intermediary not only decreases the cash flow to units that would want or need to withdraw from the unit at this time, it also imposes financial losses upon other depositing units by decreasing the over-all liquidity of their portfolio.

The possibility that households and business firms will default on their balance sheet liabilities increases when financial intermediaries default in their own liabilities; the possibility that financial intermediaries will default on their liabilities increases when households and business firms default in their liabilities. Because of the extent of the relations between private borrowers and financial intermediaries on one side and the extent of the ownership by nonfinancial private units of financial intermediary liabilities on the other, financial distress by financial intermediaries is an important step in the generation of a financial crisis. In the interrelations between households and business firms on the one hand and financial intermediaries on the other rests the possibility of a destabilizing feedback process being set in motion.

d. A decline in the market value of a unit's assets. When the flow of money to an economic unit on balance sheet or income account is interrupted or diminished, either due to a decline in income or default by other units, the economic unit will try to make up whatever deficiency exists in its cash position so that it can fulfill its own commitments. It will engage in portfolio transactions or transactions involving tangible assets in order to replenish its cash position. These portfolio transactions will consist of the sales of real or financial assets or the issuance of its own debt. A unit will be placed in financial distress if the amount of money it can realize by selling or pledging its assets is insufficient to enable it to fulfill its money flow commitments.

Transactions involving deposits in financial intermediaries are included as “balance sheet” transactions. The assumption here is that the unit with a cash deficiency does not have a sufficient amount of such deposits that it can draw upon to enable it to meet its money flow commitments.

If the market value of an asset declines, then the unit owning the asset has a realized or unrealized capital loss depending upon whether or not it sells the asset. These capital losses decrease the net worth of the unit if we measure all asset values as current market values. This decreases the unit's ability to borrow. If the decrease in the market value of the assets it owns is so great as to make the net worth of the unit negative, then the owners of the unit's debt liabilities will choose to exercise whatever powers they have to force payment, and certainly a negative net worth unit will not be able to get its debts extended or refunded. Hence the decline

the market value of assets, by decreasing the protection that a unit's net worth provides for the lenders, decreases the likelihood that a unit which needs to acquire cash by issuing its debt can do so.

The effort to meet money flow commitments by selling assets is a crucial step in the process by which financial distress is generalized into a financial crisis. If a unit needs money and the only way it can acquire money is by selling its financial or real assets, it is putting pressure on the market for this asset. Its actions will tend to lower the price of the asset. If other units are in the same predicament, then the price of the asset will have to fall until there are units which are willing to take a position in the asset. However, it is not only the units in need of money which are suffering financial losses because of the decline in the market value of this asset, but all units that own this asset.

A household can be placed in a position of financial distress if the market value of its assets decline, that is, by a decline in the value of the equity (common stock) assets it owns and the real estate type assets it owns. The market price of both of these types of assets can reflect the growth expectations prevalent in the community. A change in growth expectations can result in a sharp fall in the price of these assets. If these assets have been pledged as security for debt it is possible for the current market value of the debt to be greater than the current market value of the asset. Even if this does not take place it is now impossible to borrow as much as previously in order to hold this asset; and unless the debt were sufficiently long term, a need to pay cash in order to continue holding the asset may arise, i.e., it will be necessary to reduce the debt.

Of course the decline in the market value of its equity and real estate assets decreases the ability of a household to finance income and balance sheet expenditures in excess of disposable income. Hence the effect of a decline in income upon consumption will be greater if it is accompanied by a decline in asset prices.

Business firms may be affected by a decline in the market price of their inventories due to forced sales by units that are making current losses as well as by a decline in the market value of their real assets. Inventory liquidation is one way in which a business firm needing money can acquire money. To sell inventories fast it is necessary to lower their price. This decline in price affects the financial picture of all firms in the industry and lowers the amount they can borrow.

The market price of business firms' real assets could decline and decrease the ability of firms to borrow in order to obtain cash. It will also diminish the prospects of refinancing their position when existing loans become due.

One form of business organization that is very sensitive to the price of its real assets is the firm that owns commercial property: offices, buildings, apartment buildings, and hotels are good examples. These firms are usually large scale borrowers. Any decline in the market value of such properties will seriously affect the ability of these firms to acquire money to meet deficiencies on income and balance sheet account by borrowing or selling their assets.

Financial intermediaries are the class of economic units most sensitive to a decline in the price of their assets. The overwhelming proportion of their liabilities is fixed in dollar terms. The ratio of their total assets to the owners' investment is very high. A large proportion of their liabilities are in effect demand or call liabilities. A decrease in the market value of their assets could lead to a large-scale exercise of the demand option by their creditors.

Even though they, on the whole, purchase only debt instruments, financial intermediaries are vulnerable to a decline in the value of their assets because they typically lend for a longer term than that for which they borrow.

e. Contingent liabilities becoming current. An economic unit may be placed in financial distress because an undue amount of its contingent liabilities become current. Of course the case that comes to mind at once is insurance, but aside from the possibility of some highly unlikely events occurring, this is not a really relevant case.

The major case that is relevant is of accepting or endorsing operation. If the original maker defaults in an obligation, the contingent liability becomes a current liability and the endorsing organization acquires as a current asset the liability of the unit in distress. In the past some financial crises have taken place because financial intermediaries which specialized in endorsing were unable to fulfill their obligations.

At present the vast proportion of financial (as against insurance) contingent liabilities in existence are by government or quasi-government agencies. There is no real prospect that financial distress for any class of private units will take place because of the existence of contingent liabilities. It is included in the list in order to be complete.¹⁸

¹⁸The difficulty in developing a private mortgage insurance organization to insure conventional mortgages, which may be an essential step if a better secondary market for conventional mortgages is to develop, centers around the fact that insurance against an economic event that is the result of the performance of the economy is not equivalent to insuring against an event whose various (Continued on the following page.)

f. The exercise of demand options. Financial distress for financial intermediaries can be the result of an unexpected exercise of demand options by households, or business firms. A decline in income will put pressure on depository institutions from households. This pressure may result in net withdrawals from these institutions. This unexpected flow of money from the financial intermediaries can force these institutions to try to sell their assets. Any general attempt to realize cash by selling assets leads to a decline in asset values. This can lead to financial distress for financial intermediaries.

No organization with demand or well-nigh demand obligations is prudent if it does not have a guaranteed refinancing source so that it can acquire cash, if an unusual exercise of the demand option takes place, without being forced to sell its assets at what the market will bear. The central bank is such an organization for the commercial banks. One weakness of the American financial system is that such an organization does not exist for all demand or well-nigh demand borrowers. There has been a tendency to create special refinancing organizations for mortgage holders. Nevertheless gaps still exist, especially with respect to some money market institutions. It may be desirable to have the central bank fill these gaps when no present crisis exists rather than await a crisis situation before generalizing the central bank's responsibility.

3. The Generation of a Financial Crisis.

How is it that financial distress becomes so generalized that a financial crisis takes place? In principle two "pure" paths to financial crisis can be identified. One pure path is by way of an exogenously induced decline in income. Along this path no interaction within the financial system is allowed, i.e., the financial distress of any economic unit is due to the direct and indirect effects upon the unit of a decline in income. Since no interaction within the financial system is allowed, we cannot allow defaults by one economic unit to affect the financial position of another economic unit. Hence financial distress for all economic units will occur at the same time. There will be no period in which the extent of financial distress, extant in the economy, is increasing.

(Footnote 18, continued from the previous page.)
occurrences are independent of each other. The contingent liabilities on mortgage insurance will not become current in a random fashion, rather they will bunch at cyclical troughs. A severe recession can result in an inability of such an insurance organization to meet its commitments.

Along this first pure path, it is necessary that the decline in income be so deep and so protracted that even the most financially secure of private economic units is placed in financial distress. For such a decline in income to take place the built-in stabilizers in the income-generating model must be neutralized. Since we do not allow any repercussions of widespread financial distress to offset these stabilizers, for this pure path toward a financial crisis to be effective it is necessary to assume that massive and repeated shocks to income can take place.

The second pure path to financial crisis is one in which the internal relations within the financial system generate the financial crisis. An economic unit, for unexplained reasons, finds itself in financial difficulty. It sells assets, borrows and draws upon its deposit accounts in an effort to avoid financial distress, but to no avail. As a result of the financial distress of this unit it defaults on its payments, and economic units which own its liabilities make financial losses. The impact by way of defaults and decreases in the value of its liabilities, upon other economic units, places some of these units in financial difficulties. These units resort to borrowing, selling assets, and making withdrawals from their deposits. In spite of these defensive operations these units end up in financial distress. A cumulative rising tide of financial distress spreads through the community. There is no pressure on the financial resources of any unit due to a decrease in income; the entire financial pressure that is generated is due to the effect of the financial distress of some units upon the financial position of the other units.

Along this second pure path the dampening possibilities of secure financial positions upon the process by which financial distress affects other units has to be overcome. At any time for each economic unit there is an upper limit to the financial losses such as defaults by other units and decreases in the market price of its assets that it can absorb without having to, or feeling it necessary to, adjust its behavior to such an extent that it seriously affects the economic units with which it has financial relations. An isolated default by a bank's customers will not necessarily affect the bank's lending policy; the failure of a customer with unpaid bills will not affect the dividend policy of a giant corporation, a slight fall in the price of common stocks will not affect the consumption behavior of most households owning that stock. In addition to defaults by other units and decreases in market prices of its assets, financial distress by one unit can affect the financial position of another unit by increasing the withdrawals and calls upon the organizations that borrow at call or accept deposits. But these call type borrowing institutions will normally have some buffer cash assets which they can use to avert financial distress.

The likelihood of pure financial repercussions of financial distress generation of financial crisis depends upon the extent to

which units can absorb such financial impacts without changing their own financial behavior and ability to meet commitments. A "thin equity" enterprise cannot absorb much in the way of decreases in its asset values without being in financial distress and a "thin cash" position unit cannot absorb much in the way of interruptions, delays and defaults in money flows to it without being financially embarrassed and perhaps being forced to take losses and thus be put into a position of financial distress.

It is possible to conceive of a financial system in which almost every unit so depends upon the maintenance of the present market values of its assets for its solvency and its current receipts of money for its liquidity that the slightest decline in asset values and the slightest interruptions of money flows will generate a financial crisis. However it is not likely that the economy as a whole will be on such a thin edge: there always will be some conservative financial positions which can absorb considerable decreases in the prices of its assets and defaults on money flows to it without itself going into financial distress. However these same units with the conservative financial positions will adjust their behavior in the event that widespread financial distress is occurring, and their adjustments will often be in the direction of increasing other units' financial distress.

During a period of sustained growth two phenomena take place which affect the financial positions of representative units so that the typical protection against the impact of financial distress from other units is decreased. One is the increase in borrowing and the second is the building into the price of assets the expectation that growth will take place. The first change tends to make equity positions thinner, the second change tends to make asset values more sensitive to changes in expectations. In addition, periods of sustained booms are periods in which economic units tend to economize on cash—for there are so many profitable ways of using assets that it is expensive, in terms of opportunities foregone, for the units to hold cash. Hence during periods of sustained booms the financial relations within an economy evolve in such a manner that the possibility that an internally determined financial crisis can take place increases.

However we should recall that a decline in income imposes losses upon economic units. These losses take the form of decreasing the net worth and often the cash position of units. The decrease in net worth reduces the financial losses that the unit can absorb without being in financial difficulties. Even if no revaluation of the long-run expectation of economic growth takes place, the immediate effect of a decline in income is to make equity assets lower in price than they otherwise would have been. This too decreases the net worth of some units.

Hence it is likely that a financial crisis will be the result of a mixed path in which both the impact of a decline in income upon the financial position of economic units and the effect that the financial distress of some units has upon the financial position of other units will be operating. Returning to the model of income generation sketched in Chapter III, financial distress and decreases in the market value of assets will tend to decrease consumption and investment expenditures. The efficacy of the built-in stabilizers depends upon the existence of financial stability. If lower income induces financial distress and financial distress permits a decrease in consumption and investment to take place by neutralizing some of the built-in stabilizers in the income-generating system, a positive, destabilizing feedback is set in force.

However, if the secure financial positions are strong enough, if there are enough units with large cash and thick equity positions, then these reactions need not take place. But as growth takes place, the possibility of these destabilizing reactions increases.

We have mentioned all of the ingredients by which financial distress becomes generalized into a financial crisis in our discussion of how units are placed in financial distress. At any moment of time there are always some economic units in financial distress due to income account events and imprudent financial transactions. These random financial distresses provide a sort of background noise to the generation of generalized financial distress. The extent of such random financial distresses during a period of cyclical expansion is so small that very few units are even placed in financial distress because of the financial distress of other units. During a cyclical contraction the rate at which units are placed in financial distress because of income account events increases. At the same time assets are revalued to account for the growth that did not take place. The combination of income account and portfolio revaluation events can result in induced financial distress for some units.

This will be damped out or will accelerate depending upon the stabilizers in the income determination system and the financial position of units affected by the defaults of the units in financial distress.

As long as the decline in income and the financial distress that takes place results only in defaults on balance sheet account by households and firms, the tendency will be in the direction of dampening out the movement of financial distress. Once the attempt by units to acquire cash by selling assets becomes widespread enough to result in a serious decline in asset prices, then a serious, widespread destabilizing force is put into action, for the decline in asset prices that results affects all units holding this asset. The general and widespread decrease in net worth that takes place results in decreasing the financial impacts that all units can absorb.

If defaults on household and business firm obligations or an unexpected rise in withdrawals by households of their deposits result in a net cash flow from a depository institution such as savings banks, the depository institution will have to sell either its liabilities or its assets to acquire cash. We can distinguish between these two ways of acquiring cash by looking at the assets owned by a financial intermediary and any other economic unit for that matter as a "position" in the asset. When a unit acquires cash for withdrawals by issuing new liabilities it refinances its position, whereas when it sells its units for cash to pay withdrawals it liquidates its position. As long as units can refinance their position no excess supply of the asset in their position need appear on the market, hence no large scale decline in asset prices need occur. If units must liquidate positions in order to acquire cash then large scale excess supply of the asset can appear. A key to the generation of financial crisis is whether the holders of marketable securities who have large scale debts outstanding can refinance or must liquidate their positions when they need cash.

This is particularly pertinent for financial intermediaries, for the holders of their liabilities are so numerous and they hold so much of the marketable debt of the community. As a result, any decrease in the value of financial intermediaries' assets can endanger the financial positions of almost all units. If financial intermediaries are able to refinance their position, then no pressure need appear on the market for their assets when they need cash. The entire role of the Federal Reserve Bank as a lender of last resort to the commercial banks and as a purchaser or lender on the security of government debt is as such a refinancing organization. One of the keys to evaluation of the financial stability of the economy is the extent to which the various financial institutions can, if necessary, refinance their position.

The way in which financial distress is generalized into a financial crisis involves a number of steps:

- 1) the impact of declining income upon the financial position of economic units;
- 2) the impact of defaults by units in financial distress upon other units;
- 3) the impact of attempts to sell assets to acquire cash upon the price of such assets;
- 4) the impact of financial distress upon financial intermediaries;
- 5) the need for financial intermediaries to acquire cash by selling their assets;

6) the impact of spreading financial distress upon the income-generating system.

Of these steps, 3, 4, and 5 are crucial. If they do not occur, that is, if asset prices do not fall, if financial intermediaries can meet their cash drains and if financial intermediaries do not have to liquidate their position, then no financial crisis will occur.

F. The Financial System as a Built-in Stabilizer

1. Introduction. Up to this point we have emphasized the relations between the financial system and the generation of severe recessions. We now will turn our attention to the financial system as a built-in stabilizer. A built-in or automatic stabilizer of the economy is a set of institutions, usages and behavior patterns which without administrative or legislative intervention operate to eliminate over-all excess demand or excess supply. We will pay particular attention to the way in which the financial system can operate to increase demand from what it otherwise would be in a situation where over-all excess supply exists.

The most often cited example of a financial market whose behavior is such that it automatically tends to stabilize income is the market for FHA and VA mortgages. A legal ceiling exists on the interest rate that can be charged on FHA and VA mortgages. Whenever interest rates on corporate bonds and conventional mortgages rise sufficiently high, the mortgage intermediaries such as the insurance companies, savings banks, and savings and loan associations "leave" the FHA and VA mortgage markets. As a result of the reduction in the take-out commitments by these institutions on the low down payment, extended-term contracts that these laws provide for, the volume of speculative building declines.

Two factors make this market operate in the way it does. One is the existence of a legal ceiling on FHA and VA interest rates. The other is the elasticity of demand for housing with respect to the percentage down payment. Whereas FHA and VA mortgages require at the outside some 10 to 15 percent of the purchase price as a down payment, a conventional mortgage which is not endorsed by a government agency typically requires at least a 33 1/3 percent down payment. This means that if FHA and VA money is not available, there will be a large "reserve" demand for houses by the households which can service a "first" mortgage contract but which cannot finance a large down payment.

Given this situation, the easing of credit conditions that accompanies a downturn in business will result in a willingness of financial intermediaries to make take-out commitments to the so-called speculative builders. As a result house building has tended to behave somewhat countercyclically.

We will examine other markets and situations in which the financial system automatically acts to stabilize the economy, including in the automatic stabilizers those elements which operate to prevent the extension of localized financial distress into a generalized financial crisis.

2. The Behavior of "Private" Units. For those business firms which are not placed in financial distress by a decline in income, the liquidation of inventories, which is the first stage of the downturn, results in a large influx of cash or a reduction in their borrowings. The influx of cash means that the pressure to liquidate inventories may decrease, and these firms may willingly increase the ratio of their inventories to their sales. Also the influx of cash during the initial stages of a recession will lead to a willingness to clean up deferred maintenance. Both of these reactions are automatic and are part of the stabilizing factors that have been mentioned earlier.

In addition to the cash flow from inventory liquidation, firms' cash flow due to gross profits after taxes will not fall as much as final sales: this is due to the exemption of depreciation allowances from the corporate tax base. This flow of cash is conducive to a reduction in borrowing, a maintenance of gross investment, and the continuation of dividends.

During a mild recession the wages and salary income of most households is not impaired. As a result of the existence of relatively short-term consumer credit contracts, and an unwillingness of households to go into debt for consumer's durables during the uncertain early days of a recession, the volume of consumers' credit outstanding decreases during a recession. The flow of cash to the specialized consumer finance organizations due to the debt repayment plus their own cheaper borrowing terms makes them willing to extend credit on easier terms. The existence of households which pay off their debts and which find their income unimpaired during a recession means that as the recession proceeds an increased willingness to go into debt develops. Hence an upturn in debt-financed consumer durable sales can lead an expansion.

The imposition of regulation on consumer finance may be a way in which the more striking countercyclical aspect of the housing mortgage market may be reproduced in the consumer credit market.

The cash flows due to inventory liquidation, corporate retained gross profits, and the repayment of consumer debt all tend to lower short-term interest rates. Large commercial banks are always fully invested. The repayment of bank loans by business and consumer finance houses frees bank resources which are invested in

short-term government debt: this is done by bidding these securities away from other holders. In addition, the flow of money to business firms results in their bidding for short-term debt, further lowering market interest rates. As long as the ability of banks to create money is not reduced during a recession, the money market, without any intervention by the Federal Reserve System, will behave in a manner that is stabilizing.

Active open market operations to reduce short-term interest rates are not necessary. The only possible reasons for countercyclical open market operations are (1) the need to drive short-term rates to lower levels than the market will drive them, and (2) the need to create excess reserves in the banking system after short-term rates are as low as they can go in order to induce banks and other holders of money or short-term securities to reach for yield and thereby force the intermediate and long-term rates down.

Many states and municipalities¹⁹ have statutory limits on the interest rate they may pay when borrowing. A general rise in interest rates during an expansion increases the rate they must pay. In addition, as the volume of state and municipal bonds outstanding increases, it is necessary for new state and municipal bonds to be sold to units which do not value the tax-exempt feature as highly as holders of existing issues. For example to a unit whose marginal tax rate is 80 percent, a 2 percent tax-exempt bond is equivalent to a 10 percent yield on a tax-liable instrument, whereas to a unit with a 50 percent marginal rate the same security is the equivalent of a 4 percent tax-liable yield. A rise in the market rate accompanied by a decrease in the worth of the tax-exempt status to the marginal lender can result in a sharp rise in state and municipal interest rates. This may cause some states and municipalities to postpone projects. Once interest rates ease and the prospect for capital gains through the ownership of equities diminishes they may be able to finance their projects at interest rates which are within their ceiling. Hence an increase in construction by states and municipal governments may follow a downturn in income.

For financial markets to be stable, there must be some units which are willing to take a position (i.e., increase their holdings) on a falling market. By analogy with the usage of the stock exchanges we will call units which take such a position as a normal course of their activity "specialists." There are two reasons why a unit will increase its holdings of an asset on a falling market: one is speculative and the other is that it can make on the carry.

¹⁹Recall that state and municipal governments are considered to be private economic units.

If a unit expects that the price trend will soon be reversed, then it will buy in a falling market in the belief that it will soon be able to sell the security at a higher price than it paid for it. However if there is no floor under the security the unit may, in exchange for this possibility of gains if the price trend is reversed, be accepting a possibility of large losses if the price trend is not reversed.

In making a market in securities on the stock exchanges, specialists are more willing to take a position if there is a large order book just below the market. In this case their potential losses are limited. Hence a large number of purchasers willing to purchase a security at some relatively small discount from the present market price makes for a stable market in the security. To date in the postwar boom apparently there has always been a strong order book for most so-called blue chip securities at prices just below the present market. As long as this is true the market for these equities will be stable.

The other reason for taking a position in a security during a falling market is if the buyer can "make on the carry." By "making on the carry" we mean a situation where the running yield is greater than the interest rate the owner must pay in order to finance his position. For example if a 4 percent bond is selling at 80, the running yield is 5 percent (the yield to maturity which includes the guaranteed capital gain at the due date may be 6 percent, and the rate at which the owning unit can borrow is 4 percent, then the unit will make 1 percent on the carry. In this case the unit will be willing to take as large a position as it can finance.

If guaranteed, unlimited financing to specialists exists at an interest rate such that not too great a fall in the price of the security will result in the specialists' making on the carry, then the market under consideration will be stable. This is one reason why access of the Government bond dealers to the central bank's discount window is desirable; by guaranteeing unlimited financing at a posted rate in times of potential crisis, such access determines an upper limit to the possible fall in the price of these assets.

If the financial system acts in an analogous manner with respect to stock exchange securities it can aid in stabilizing the price of these assets. If margin requirements and the interest rates on carrying margin accounts are lowered as the common stock price level falls, then households can be expected to take positions in the stock as the price of the stock falls. Given the expected dividend, for each market price of the security there is a running yield.

During a speculative boom the running yield will be very far below the interest rate that will have to be paid in order to carry the security. Under these circumstances the margin requirements

should be high, say 100 percent. For when this condition prevails the price of the security is based upon the expected rise in its price.

On the other hand if the price of the security falls so that the yield is higher than the interest rate by more than a reasonable risk premium, very low margin requirements should be in effect. It may be necessary to have different interest rates on margin loans based upon different securities due to the different degrees of risk they embody. But by varying margin requirements and interest rates applicable to loans using stock exchange collateral, the stability of the stock exchange assets can be enhanced.

In addition to varying margin requirements any financial system which includes nonprice rationing may act as a built-in stabilizer. If nonprice rationing results in the existence of a fringe of unsatisfied demand, then if excess supply threatens, a relaxation of the nonprice rationing terms will result in an increase in demand. Controls over the extent of debt financing of commercial and industrial construction and consumer credit, as well as of stock market purchases on margin are examples. Of course in any "nonprice rationing resulting in an increase in demand when relaxed" hypothesis it is assumed that the postponed demand is still there when terms are changed. I would conjecture that this is true if the excess supply appears because of an increase in productive capacity; it is not so certain to be true if the excess supply is the result of a decrease in aggregate demand.

3. The Behavior of the Central Bank. In its very essence the central bank is the operator of the discretionary element in the financial system. Hence none of its operations can be considered in the nature of an automatic stabilizer. There is one aspect in which the central bank can operate as a destabilizer. If its pattern of behavior with respect to events such as the existence of excess supply or excess demand is too well known, then other units will operate on the basis of what they expect the central bank to do. This can result in very rapid price and interest rate changes; so that short-term interest rates appropriate to a great depression can occur during a mild recession and long-term interest rates appropriate to a major boom can rule immediately after a lowering turning point.

This ability of security prices to change very rapidly, if it is known that monetary policy is the major policy tool, is an argument in favor of having the central bank keep a stable over-all financial environment during the business cycle and relying more upon either direct controls or on fiscal policy measures.

4. The Behavior of the Government. The government's financial behavior, both on account of its tax receipts and its transfer payments to households, is a factor tending to stabilize the economy.

However the efficacy of the government as a stabilizer depends upon the relative size of the government — especially the ratio of income elastic tax receipts to full employment income and the ratio of transfer payments to the income of an employed member of the labor force.

If social security, etc. payments are a large proportion of the income of the employed worker, and if income elastic taxes are a significant proportion of gross national product, then, if a recession takes place, the cash deficit of the government will be large. This will result in a large increase in the riskless assets in the private system which is in itself a stabilizer.

However, if social security benefits and the over-all federal government budget do not grow with the economy, the efficacy of the automatic financial stabilizer due to the government will decline. For the government to remain a potent stabilizer on the financial scene it is necessary for government to grow with the economy.

V. SOME EMPIRICAL INVESTIGATIONS

A. Introduction

In this chapter the results of some modest empirical investigations are presented. The aim of these investigations is to find out what happens in the financial sector as the economy goes through a sustained boom interrupted only by mild downturns. These investigations were not designed as formal tests of the evolutionary hypothesis that underlies the theory of severe recessions presented here, but rather as background material which can indicate lines for further research. However some of the observations do seem to be consistent with the proposition that during a sustained boom the financial system evolves in such a way that greater financial instability results.

The periods 1920-29 and 1946 to date have been characterized as periods of sustained boom. These prolonged booms contain shorter and milder cyclical fluctuations which for want of a better term we will call short business cycles. In the National Bureau chronology contained in Table II-1, the period March 1919 to April 1958 is divided into nine trough-to-trough business cycles. Of these nine business cycles, six (1919-21, 1921-24, 1924-27, 1945-49, 1949-54, and 1954-58) are business cycles contained within our two longer sustained booms.

From our present point of view, the other three business cycles between 1919 and 1958 are special cases. The business cycle of

TABLE II-1

The Dating and Duration of Business Cycle Expansions and Contractions
United States 1919-1960

United States 1919-1960

Business Cycle				Average Quarterly Rate of Change	Duration of: Expansion Contraction (months)
Monthly Dating		Quarterly Dating*			
Trough	Peak	Trough	Peak		
Mar. 1919	Jan. 1920	July 1921	1919-1		10
July '21	May '23	July '24	1921-111		22
July '24	Oct. '26	Nov. '27	1924-111		27
Nov. '27	Aug. '29	Mar. '33	1927-1V		21
Mar. '33	May '37	June '38	1933-1		50
June '38	Feb. '45	Oct. '45	1938-11		80
Oct. '45	Nov. '48	Oct. '49	1945-1	Expansion Contraction	37
Oct. '49	July '53	Aug. '54	1948-1V	1.032	11
Aug. '54	July '57	Apr. '58	1949-1V	1.032	13
Apr. '58	Mar. '60		1954-111	1.018	35
			1958-11	1.020	23
			1960-11	---	

*Quarter in which peak month occurred.

Source: G. H. Moore, Measuring Recessions, Occasional Paper 61, (New York: National Bureau of Economic Research, Inc. 1956), pp. 260, 261.

November 1927 to March 1933 contains the great contraction of 1929-33. This is the single example of a contraction associated with a severe financial crisis for which large bodies of data relating to financial interrelations are available. The cycle of March 1933 to June 1938 contains the large but nevertheless unsatisfactory recovery from the great trough of March 1933. The period following the decline of 1929-33 can be characterized as a period of stagnation. The cycle of June 1938 to October 1945 is dominated by World War II and hence is very special.

Both March 1919 and October 1945 can be considered as roughly equivalent new beginnings for the financial and real sectors of the economy. Both of these new beginnings take place immediately after the end of a great war and we know that they are thresholds for great booms. At these times reconversion to peacetime production can be said to begin and the financial structure represents a position inherited from the financing of a war. We want to examine what financial changes occur during the shorter and milder cycles which took place after these two new beginnings. Of course at this writing (as far as we know) we have not reached the end of the post-World War II prolonged boom.

The institutional framework within which the three cycles between March 1919 and November 1927 took place differs from that within which the three cycles between October 1945 and April 1958 occurred, in that the emphasis upon the government's responsibility for economic stability was much greater in the second period than in the first. In addition: (1) The 18-month decline from January 1920 to July 1921 was more severe and was accompanied by more financial stringency than any of the other "mild" cycles of this group. (2) The cycle of October 1949 to August 1954 was affected by the outbreak and existence of the Korean War. As a result, for some comparisons it might be best to exclude these two special cycles and include only the trough-to-trough cycles of July 1921 to July 1924 and July 1924 to November 1927 in the interwar period and October 1945 to October 1949 and August 1954 to April 1958 in the postwar period.

Even though the two sets of cycles being examined are examples of short and mild fluctuations, the proportion of time spent in contraction is smaller in the post-World War II period than in the interwar period. The three interwar expansions covered 59 months, the three interwar contractions covered 45 months, so that 43 percent of the total 104 months that elapsed was spent in contraction. The three post-World War II expansions covered 117 months, the three contractions covered 33 months, so that 22 percent of the total 150 months that elapsed was spent in contraction. If we consider only two cycles in each period, then in the interwar period boom, 49 months were in expansion and 27 months were in contraction, so

that 36 percent of the total 76 months that elapsed was in contraction. In the post-World War II period 72 months were in expansion and 20 months were in contraction, so that only 22 percent of the 92 months was spent in contraction. Regardless of whether we look at two or three cycles in each period, it is obvious that a smaller percentage of the total time was spent in contraction in the post-World War II period than in the interwar period. These changes in the relative duration of the contractions may be a measure of the efficiency of the built-in fiscal stabilizers.

This change in the relative duration of contractions has an interesting implication for the movement of the price level during the two boom periods. If the price level rises during the expansion phase of the cycle, due to the existence and expectation of excess demand, if it falls during the contraction phase of the cycle due to the existence and the expectation of excess supply, and if the time rate of change of prices (as a percentage of the price level) is the same (but of different signs) for both expansion and contraction and independent of the magnitude and duration of excess demand and supply, then there would be a greater rise in prices over a period covering a number of such small cycles during the postwar boom than in the interwar boom.¹

Quarterly data available for the post-World War II period show the vigor of the expansion. During the first two postwar expansions gross national product increased at a rate of 3.2 percent per quarter; in the two following expansions the expansion was 1.8 percent and 2.0 percent per quarter. In addition the downturns were very mild, the rate of decline in the first contraction was .8 percent per quarter; in the contraction of 1953-54 the rate of decrease was .3 percent and in the 1957-58 contraction the rate was again .8 percent.

¹Assume during each month of expansion prices rise by λ_1 percent and during each month of contraction prices fall by λ_2 percent so that $\lambda_1 \lambda_2 = 1$. Then with an initial price level of p_0 , the price level at p_n will be $p_n = p_0 \lambda_1^\tau \lambda_2^{n-\tau}$, where τ is the number of months of expansion, $n-\tau$ the number of months in contraction, and $\tau > n-\tau$. This becomes $p_n = p_0 \lambda_1^{2\tau-n}$. If we wish to consider the percentage of time spent in expansion and contraction as our basic variables, we would have $p_n = p_0 \left[\lambda_1^{\tau/n} \lambda_2^{\frac{n-\tau}{n}} \right]^n = p_0 \left[\lambda^2 \left(\frac{\tau}{n} \right) \right]^n$. Obviously the ratio p_n/p_0 depends upon the percentage of time spent in expansion.

The basic problem of this chapter is "what happens to the financial sector during such great booms?" In addition we will take a brief look at what happened to the financial sector during the contraction and stagnation periods.

On the whole, the data examined are consistent with the proposition that the financial changes associated with a sustained boom are such that the possibility of financial difficulties increase as the boom is prolonged. The continuing flow of systematic data on financial interrelations from the Federal Reserve System's flow of funds/savings unit will enable us in time to make much more precise observations on how the structure of financial interrelations changes during good times.

B. Financial Changes During Prolonged Booms

In this section we will look at some of the financial changes that have occurred between 1919 and 1929 and since the end of World War II. We will examine changes in velocity, in the portfolios of the monetary system, and in the balance sheets of nonfarm households, nonfinancial corporations, commercial banks, mutual savings banks, savings and loan associations and life insurance companies.

1. Velocity Changes. An over-all attribute of the financial system which is significant for determining the possibility of financial crisis is the ratio between money and income, that is, the income velocity of circulation of money. This ratio is significant, for it is a measure of both the nature of the time gaps between receipts and payments which can occur without causing any appreciable financial embarrassment and the defaults on money flows which can be absorbed by the various units.

A number of conceptual difficulties are involved in the definition of money. There obviously is a difference between money which is the result of a commercial bank's owning private debt and money which is the result of a commercial bank's owning gold or government debt. If the bank owns private debt, two things are true which are not true in the case of gold or government debt:

- 1) the asset is a risk asset;
- 2) the debt of the private unit implies a balance sheet constraint upon the private unit's behavior. Hence in examining velocity changes during the expansions and contractions of the interwar and postwar periods we will look at two concepts of velocity: one the traditional velocity in which money is defined as demand deposits and currency and the other the "Pigouvian" velocity in which money is defined as the gold stock, treasury currency and the government debt outside of government trust funds.

The traditional concept includes all assets which in their present form can be used to make payments; the Pigouvian concept includes all assets of the monetary system and the public which are free of risk as to default of principal and interest (if any) and which do not constrain any decision-making unit. Note that the Pigouvian concept of money is closer to that which is implicit in various 100 percent money schools than it is to the conventional demand deposits plus currency concepts. Also note that in an era where interest rates, especially long-term interest rates, are flexible the long-term government debt content of Pigouvian money is not free from a liquidity or market risk.

During the period 1919-29 there was a slight upward trend in income velocity, and most of the change occurred during the expansion which began in November 1927. In August 1929 the estimated traditional velocity was 3.94. This is in contrast to the strong trend that the traditional velocity has exhibited in the post-World War II sustained boom. If 4.00 is taken as a "peak" income velocity on the basis of the observed velocity of 3.94 in 1929, then in November 1948 traditional velocity was 54 percent of the potential peak and in March 1960 it had risen to 80 percent of the potential peak. That is, it could be argued that the scarcity of money relative to income is approaching the 1929 level.

However any investigation of the relative scarcity of money can not ignore the various changes such as improved communications, greater use of charge account credits, the recent growth of bank "overdraft" arrangements, the improved techniques for managing corporate cash, and the growth of liquid assets that are substitutes for money. These usages and institutions may affect the demand for money so that the ceiling to income velocity is significantly greater now than was achieved in 1929.

The second velocity concept, Pigouvian velocity, shows a strong trend during the 1919-29 period. Between the peak of January 1920 and the peak of August 1929 the value of Pigouvian velocity increased from 3.35 to 5.59 or 67 percent. The same strong trend has been shown in the post-World War II period, between the cycle peak of November 1948 to that of March 1960 Pigouvian velocity increased from 1.22 to 2.06, a rise of 69 percent. However in the 1926-29 period there was a very sharp rise in Pigouvian velocity, whereas in the 1957-60 period no such rise has occurred.

The difference in the behavior of Pigouvian velocity in two periods is a reflection of the difference in the course of the government debt. Between 1919 and 1929 approximately 40 percent of the government debt was retired from the private economy. Between 1945 and 1948 the public debt outside of U.S. trust funds was lowered by some 15 percent, but as a result of both recessions and the cold war the relevant public debt has grown by some 11 percent since then.

TABLE II-2

Income Velocity, Traditional and Pigouvian
1919-1929 and 1945-1960

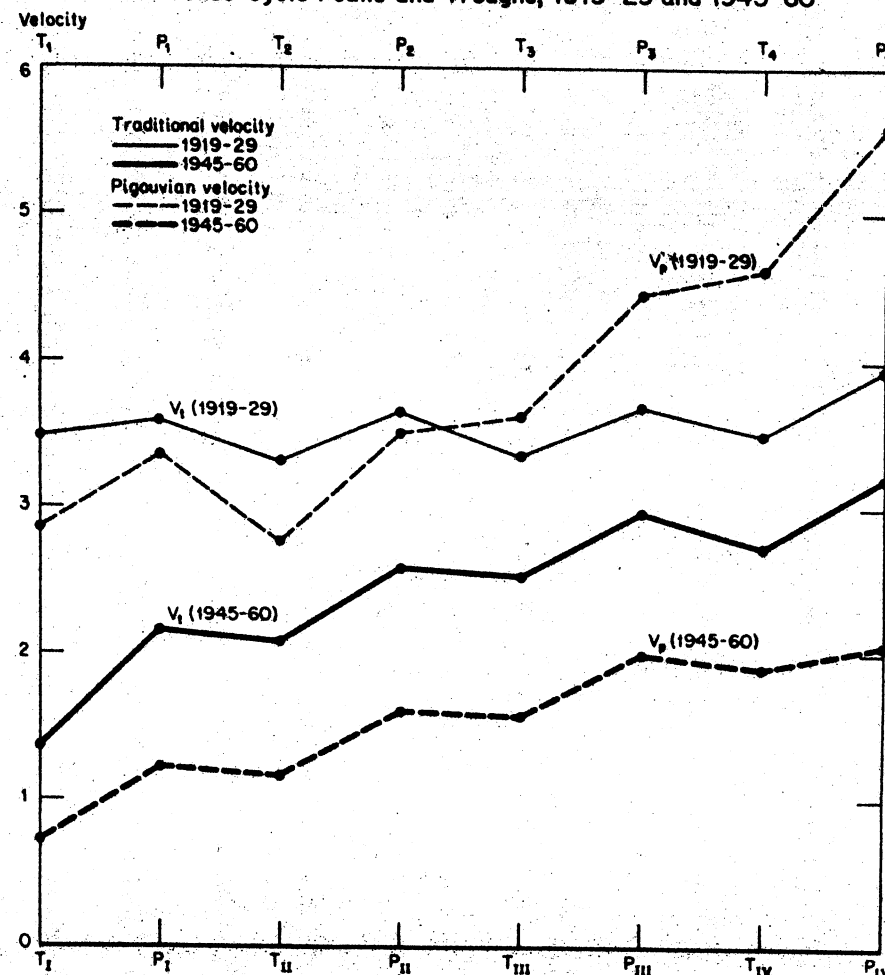
Trough	Peak	(1) GNP $\times 10^9$	(2) M_t $\times 10^9$	(3) M_p $\times 10^9$	(4) V_t 1 + 2	(5) V_p 1 + 3	
Mar. '19		77.1	22.2	26.9	3.48	2.86	T_1
	Jan. '20	86.2	24.0	25.8	3.59	3.35	P_1
July '21		70.3	21.2	25.5	3.31	2.76	T_2
	May '23	84.3	23.1	24.0	3.65	3.51	P_2
July '24		83.4	24.9	23.0	3.36	3.63	T_3
	Oct. '26	95.3	25.8	21.4	3.69	4.46	P_3
Nov. '27		93.5	26.7	20.3	3.50	4.62	T_4
	Aug. '29	104.4	26.5	18.7	3.94	5.59	P_4
Oct. '45		182.8	134.4	253.5	1.36	.72	T_1
	Nov. '48	265.9	122.9	217.9	2.16	1.22	P_1
Oct. '49		257.0	123.8	221.9	2.08	1.16	T_{II}
	July '53	367.1	142.4	229.9	2.58	1.60	P_{II}
Aug. '54		362.0	143.1	230.4	2.53	1.57	T_{III}
	July '57	445.6	149.8	224.2	2.97	1.99	P_{III}
Apr. '58		429.0	157.5	225.7	2.72	1.90	T_{IV}
	Mar. '60	500.2	155.8	242.8	3.21	2.06	P_{IV}

Symbols: M_t = Traditional Money
 M_p = Pigouvian Money
 V_t = Traditional Velocity
 V_p = Pigouvian Velocity

Source: Federal Reserve Bulletin: Various issues.

CHART II-2

Traditional and Pigouvian Velocity
Reference Cycle Peaks and Troughs, 1919-29 and 1945-60



If fiscal policy operates so that large cash deficits occur in recessions and small surpluses in boom times, then the Pigouvian velocity will not rise at the same rate as in the 1920's.²

²The adoption of a budget policy in which the budget is balanced at some target level of income or employment (such as is suggested in the January 1962 Economic Report of the President, pp. 78-81) will tend to assure that whatever decline occurs in the debt owned by the public will be modest.

TABLE II-3

Government Debt Outside U.S. Trust Funds
(In billions of dollars)

End of Year	
1919	25,076
1922	22,270
1929	15,723
1945	249,204
1948	213,313
1959	237,200

Source: Federal Reserve Bulletin: Various Issues.

Pigouvian velocity measures the ratio between income and the market value of assets which are free of default risk and which do not constrain decisions.³ These are assets whose value would not fall if the private economy declined. To the extent that the so-called real balance effect is effective, it operates by way of Pigouvian money affecting the ratio of consumption to income.

2. Over-all Changes in the Portfolio of the Monetary System. The money supply consists of demand deposits (adjusted) and currency outside banks. Some authorities argue that in order to assure the growth of the economy, the Federal Reserve System should control the reserves of the banking system so that the money supply grows at a steady rate.⁴ (There is some evidence that the Federal Reserve System has been following some such steady growth rule.) This view neglects the influence that the nature of the assets owned by the banking system may have upon economic units. In other words to know the effects of the money supply it is necessary to look not only at the quantity of money but also at the assets of the banking system.

³Government guaranteed debts, such as FHA and VA mortgages, constrain the debtor even though the lender is protected, partially or totally, against default risk. Hence, such insured, guaranteed or endorsed private liabilities are not a part of the Pigouvian money. Similarly outstanding state and municipal debts constrain decisions by these units.

⁴Milton Friedman A Program For Monetary Stability (New York, Fordham University Press, 1959).

As was mentioned earlier, commercial banks are organizations that perform many different services. It is necessary to segregate the time deposit activities of the commercial banks from their savings deposit activities. In their savings deposit activities, commercial banks are savings intermediaries just as are life insurance companies, mutual savings banks, etc. In their demand deposit activities commercial banks are a part of the monetary system and can "force" their liabilities upon the community (unless the monetary system breaks down as in a hyperinflation).

We arbitrarily assume that the "savings department" of a "bank" has all the net worth and the riskiest of assets. We do not give this department any cash at all. The "demand deposit" department of a bank has all of the reserve money, vault cash and the safest assets owned by the bank. Assets owned by a bank listed in order of increasing riskiness, are cash (including gold), government debt (including treasury currency), and private debt. If in a

TABLE II-4

Composition of the Money Supply

June 1922 and 1929

(In millions of dollars)

	June 1922	June 1929
Federal debt owned by monetary system	4,540	5,161
U.S. Treasury currency	1,035	1,093
Gold Stock	3,498	4,037
Total "Public Assets"	9,073	10,291
Total Demand Deposits (adjusted) and Currency	21,391	26,179
Public Assets/Demand Deposits and Currency	42.4	39.3

Source: Federal Reserve Bulletin: Various Issues.

consolidated balance sheet for the monetary system (Treasury monetary operations, Federal Reserve System and commercial banks) the value of gold plus government debt (including Treasury currency) is greater than or equal to the value of demand deposits plus currency, then we can assert that the money supply is riskless and does not constrain private and subsidiary government units.

If however demand deposits plus currency outside banks exceed the value of gold plus government debt in existence, then some private debt is monetized. The extent to which private debt is monetized represents the pressures placed upon private units by debt to monetary institutions. Since debt, especially short-term unfunded debt, tends to constrain economic activity, the repercussions of an increase in the money supply are not independent of whether private debts or public debts are owned by the monetary system.

In Tables II-4 and II-5 the ratio of various classes of assets to the money supply is given. Between June 1919 and June 1929, the ratio of Public Assets owned by the monetary system to Demand Deposits and Currency fell from 42.4 percent to 39.3 percent. This is not a great change in the asset composition of the monetary system but it gives some slight evidence of a trend from public to private debt during this period.

The changes that have occurred since 1946 are much more striking. In 1946, no private debt was "monetized"—the money supply was riskless. The monetary system was so "full" of government debt and gold that more than \$20 billion of government debt owned by the banking system could be assigned to the savings departments of commercial banks. In the year 1949-50, for the first time in the postwar period it was necessary to allocate private debt to the monetary system. From 1 percent of the assets of the monetary system in December 1950, private debt assigned to the monetary system has increased to 24.8 percent of the assets of the monetary system in December 1959. During this period (1950-59), the money supply increased by \$27,530 million and the private debt assigned to the monetary system rose by \$34,764 million. The large increase in risk assets assigned to the monetary system implies that the expansionary effect of the increase in money was in part counteracted by the inhibiting effect of the rise in private debt owned by the monetary system.

This tendency, very marked in the 1950's, to shift from a portfolio entirely made up of riskless assets to one weighted very heavily with risk assets was not evident in the 1920's.⁵ It may be that a "bankers constraint" operates to keep a large portion of the portfolio of the monetary system invested in riskless assets, and that 60 percent private debt may be a ceiling that results from bankers

⁵Some of the risks involved in private debts in the post-World War II periods are absorbed by government endorsements and guarantees, which have grown enormously since 1935. See George F. Break The Economic Effect of Federal Loan Insurance (Washington, D.C.; National Planning Association, 1961).

TABLE II-5

Net Monetized Private Debt, 1929-1959
(In millions of dollars)

	Currency and Demand Deposits Total	Net Gold	Net Gov't.		Net Pvt.		Percentage of Total			
			Debt	Debt	Debt	Debt	Net Gold	Net Gov't. Debt	Net Gov't. Debt	Private Debt
June 1929	26,180	3,672	7,139	15,369			.140	.273	.587	
June 1933	19,172	4,324	11,508	3,340			.226	.600		.174
June 1939	33,360	13,524	21,033	- 1,197			.405			
Dec. 1945	102,341	17,924	104,884	-20,467			.175			
Dec. 1946	110,044	18,644	111,904	-20,504			.169			
Dec. 1947	113,597	21,072	107,990	-15,465			.185			
Dec. 1948	111,600	22,141	100,384	-10,925			.198			
Dec. 1949	111,166	22,277	99,672	-10,783			.200			
Dec. 1950	117,670	20,188	96,246	1,236			.172			.010
Dec. 1951	124,547	20,416	97,383	6,748			.164			.054
Dec. 1952	128,800	20,686	97,702	10,412			.161			.081
Dec. 1953	130,544	19,336	100,265	10,943			.148			.084
Dec. 1954	134,400	18,384	103,935	12,081			.137			.090
Dec. 1955	138,198	18,523	96,545	23,130			.134			.167
Dec. 1956	139,727	18,643	92,973	28,111			.133			.201
Dec. 1957	138,557	19,511	91,095	27,951			.141			.202
Dec. 1958	143,000	16,600	100,500	25,900			.116			.181
Dec. 1959	145,200	16,300	92,900	36,000			.112			.248
		(=Gold -Foreign Bank Deposits)	(=Gov't. Debt +Treas. -Gov't. Deposits)	(=Net Loans +Other Sec. -Time Deposits -Capital & Misc. Accounts)						

behavior. If these constraints are still an effective determinant of the asset structure of commercial banks we can expect a significant rise in private debt relative to public debt to take place.⁶

3. Some Balance Sheet Changes. During a prolonged boom, savings out of income and price of assets change, and a large amount of private investment has to be financed. What happens to the balance sheets of households, ordinary business firms and financial intermediaries during such a period? As a result of the massive savings study by Goldsmith⁷ and the Federal Reserve System's flow-of-funds studies it is possible to compare balance sheets of various sectors at selected dates. In this section we will look at the changes in the balance sheets of these units in the 1920's and in the post-World War II period. In the next section, as an aside, we will examine what happened during the great contraction of 1929-33 and the stagnant period of 1933-39.

a. Nonfarm households. In Table II-6, part (a) the balance sheet data for Nonfarm Households for the years 1922, '29, '33 and '39 are exhibited. In addition, data on the percentage distribution of assets and liabilities among types, the change in the various types of assets between successive dates, the percentage distribution of the changes, and the ratio of the various types of assets between successive dates that are used is shown.

In Table II-6, part (b) similar information is shown for the years 1946 and 1958.

The following observations about the material in Tables II-6(a) and (b) seem pertinent:

1) Between 1922 and 1929 total assets of households grew by 68 percent; between 1946 and 1958 total assets grew by 136 percent.

2) Between 1922 and 1929 the most rapidly growing intangible assets, among those which amounted to more than 1 percent of the

⁶Assume that the money supply is 20 percent currency and 80 percent demand deposits, and that commercial banks keep 15 percent reserves with the central bank. If the central bank owns only gold and Government bonds, then the ratio of riskless assets to money will be 32 percent. If we add that commercial banks keep 10 percent of their deposit liabilities in Government bonds, we reach a 40 percent riskless asset floor for the monetary system.

⁷Raymond W. Goldsmith, A Study of Saving in the United States (Princeton, N.J.: Princeton University Press, 1955). The August 1959 Federal Reserve Bulletin contains "A Quarterly Presentation of Flow of Funds, Saving, and Investment," which was used here.

TABLE II-6(a)

Nonfarm Households,
Selected Balance Sheet

(Billions of dollars)

	Date 1922	Date 1929	Date 1933	Date 1939	Percent 1922	Percent 1929	Percent 1933	Percent 1939	Percent 1922-1929	Percent 1929-1933	Percent 1933-1939	Percent 1922-1939	Percent 1929-1939	Percent 1933-1939
Intangible Assets	108.46	146.82	180.98	245.10	10.6	16.6	20.6	28.3	38.8	25.9	43.8	28.4	98.5	30.6
Currency and demand deposits	25.46	36.70	35.31	41.36	9.7	8.2	11.2	11.0	11.0	20.8	-1.4	6.1	66.6	5.9
Other bank deposits & shares	7.77	15.85	18.90	26.43	2.9	3.5	5.9	7.1	8.1	3.1	7.7	17.9	17.9	6.7
Life insurance reserves	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pension & retirement funds, private	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mortgages	11.40	17.48	16.30	13.46	4.1	3.9	5.2	3.6	6.4	-1.2	-2.8	-4	3.5	3.9
Securities, U.S. govt.	9.91	14.05	6.05	8.77	3.7	9	1.9	2.2	5.9	2.0	2.2	13.1	13.1	3.2
Securities, state & local	4.90	7.65	9.48	8.32	1.9	1.7	3.0	2.2	2.7	1.8	-1.2	2.6	2.6	1.5
Securities, other bonds & notes	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Securities, preferred stock	55.32	138.05	57.06	73.18	20.7	30.7	19.1	19.5	82.73	-81.0	16.1	27.3	15.3	60.3
Securities, common stock	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Equity in mutual funds, corp.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Equity in other business	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other loans and intangible assets	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	158.46	245.10	310.85	410.26	59.3	63.3	61.7	61.2	126.6	-90.6	34.4	170.8	69.3	49.4
Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Payables to firms, intermediaries	2.43	5.73	6.53	6.60	1.1	1.2	2.1	1.8	2.9	-0.8	-1.1	1.6	-4	-2
Payables to other business	2.06	4.55	2.49	4.69	.8	4.3	.8	1.3	2.5	-2.1	2.2	1.4	1.4	3.7
Borrowing on securities	4.53	11.58	4.09	1.87	1.7	2.6	1.3	.5	7.1	-7.6	-2.2	3.9	5.7	3.7
Mortgages	9.97	23.27	30.30	30.00	3.7	5.2	6.4	5.3	12.3	-3.2	-1.1	7.3	2.4	-2
Bonds and notes	26	1.70	1.50	.70	.1	.4	.5	.2	1.4	-1.2	-0.8	.8	-1	1.4
Accounts	2.39	3.69	3.78	4.35	.9	.8	1.9	1.9	1.9	-1.1	.6	.7	-1	1.0
Other liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	22.44	50.75	30.61	30.81	8.3	11.3	12.2	10.4	20.6	-19.1	.2	15.7	9.0	.3
Equities (ownership interest)	85.58	399.50	277.21	375.85	91.7	88.7	87.8	89.6	153.9	-122.3	58.6	88.3	91.0	99.7
Total Assets or Liab. & Equities	243.94	644.60	588.06	786.11	100.	100.	100.	100.	126.6	-134.4	93.8	265.3	100.	100.

a: 1. All data (1922-39); includes nonfinancial nonprofit institutions and personal trust departments.
2. Liabilities: (1922-39) data not comparable to (1946-58) data.

TABLE II-6 (b)

Nonfarm Households (Billions of dollars)

	Data 1946	Data 1958	Percent 1946	Percent 1958	(1958- 1946)	Percent (1958- 1946)	1958 1946
I Tangible Assets	239.91	631.98	37.5	41.9	392.1	45.2	2.63
II Intangible Assets							
1. Currency and demand deposits	48.92	53.17	7.6	3.5	4.3	.5	1.09
2. Other bank deposits and shares	59.06	140.43	9.2	9.3	81.4	9.4	2.38
3. Life insurance reserves	44.56	99.80	7.0	6.6	55.2	6.4	2.24
4. Pension and retirement funds, private	2.94	24.81	.5	1.6	21.9	2.5	8.44
5. Mortgages	13.07	27.94	2.0	1.9	14.9	1.7	2.14
6. Securities, U.S. government	51.27	51.89	8.0	3.4	.6	.1	1.01
7. Securities, state and local	10.89	23.70	1.7	1.6	12.0	1.5	2.18
8. Securities, other bond and notes	7.79	11.73	1.2	.8	3.9	.4	1.51
9. Securities, preferred stock	8.70	10.23	1.3	.7	2.0	.2	1.25
10. Securities, common stock	92.30	326.99	14.4	21.7	234.7	27.1	3.54
11. Equity in mutual financial organizations	1.24	4.38	.2	.3	3.1	.4	3.53
12. Equity in other business	57.32	96.55	9.0	6.4	39.2	4.5	1.68
13. Other loans and intangible assets	2.48	3.70	.4	.2	1.2	.1	1.49
14. Total	400.04	875.32	62.5	58.1	475.3	54.9	2.19
III Liabilities							
1. Consumer debt	8.00	44.31	1.3	2.9	36.3	4.2	5.54
2. Trade debt	.60	1.83	.1	.1	1.2	.1	3.05
3. Loans on securities	1.76	6.01	.3	.4	4.3	.5	3.41
4. Bank loans n.e.c.	.60	2.01	.1	.1	1.4	.1	3.35
5. Other loans	1.90	4.37	.3	.3	2.5	.3	2.30
6. Mortgages	19.24	112.26	3.0	7.4	93.0	10.7	5.83
7. Total	32.10	170.79	5.0	11.3	138.7	16.0	5.32
IV Equities (net worth)	607.85	1,336.51	95.0	88.7	728.7	84.0	2.20
V Total Assets or Liabilities & Equities	639.95	1,507.30	100.	100.	867.4	100.	2.36

Sources: Worksheets provided by the Commission on Money and Credit. A somewhat revised version of this data will appear as a supplement in the Statistical Appendix to Raymond W. Goldsmith and R.E. Lipey, Studies in the National Sheet (New York; National Bureau of Economic Research, forthcoming).

total assets of households, were common and preferred stock and life insurance reserves; between 1946 and 1958 the most rapidly growing intangible assets of households were private pension and retirement funds, common stock, and other bank deposits and shares.

3) Between 1922 and 1929 the total liabilities of households grew by 129 percent whereas the net worth of households grew by 63 percent. During this period borrowing on securities grew by 156 percent and mortgages by 133 percent. Between 1946 and 1958 the liabilities of households grew by 432 percent while the equity interest grew by 120 percent. During this period mortgages grew by 483 percent and consumers debt by 454 percent. Loans on securities increased a modest 2.41 percent.

4) In 1922 liabilities of households were 8.3 percent of total assets; in 1929 they were 11.3 percent. In 1946 liabilities of households were but 5 percent of household total assets, but by 1958 they were 11.3 percent of total assets.

5) Between 1922 and 1929 common and preferred stock rose from 20.7 percent to 30.7 percent of total household assets. Between 1946 and 1958 common stock rose from 14.4 percent to 21.7 percent. Equity in mutual financial organizations rose from .2 percent to .3 percent and preferred stock fell from 1.3 to .7 percent of total assets.

6) In 1922 tangible assets were 40.6 percent of nonfarm household assets; by 1929, tangible assets had fallen to 36.6 percent of the total. In 1946 tangible assets were 37.5 percent of household assets whereas in 1958 they were 41.9 percent of household assets.

During both sustained booms there was an increase in household debt relative to household net worth, and in the proportion of total assets represented by the value of common stocks. These two observations are consistent with each other and the increasing vulnerability to financial distress hypothesis.

The big difference between the two booms lies in what happened to tangible assets. In the 1922-29 period 30.6 percent of the increase in assets was in the form of tangible assets, whereas in the 1946-58 period 45.2 percent of the change in total assets was an increase in tangible assets owned by households.

b. Nonfinancial business. In Tables II-7(a) and (b), the liability side of the balance sheet for nonfinancial corporations is exhibited. The following observations about the material in these tables seem pertinent:

1) There was no significant change in the ratio of equity to total liabilities including equities in the balance sheets between 1922 and 1929; the ratio was approximately 40 percent "liabilities" and 60 percent "equities."

2) There was a slight increase in the ratio of equity to total liabilities between 1946 and 1958: in 1946 equities were 66.3 percent of the total and in 1958 they were 67.5 percent.

3) Mortgages plus bonds and notes were 18.6 percent of total liabilities and equities in 1920, 20.2 percent in 1929, 11.7 percent in 1946 and 13.1 percent in 1958.

The decrease in the ratio of debts to total liabilities including equities in the post-World War II period when compared to the 20's is of course a factor which would tend to decrease the likelihood of a financial crisis occurring, for the smaller this ratio the smaller the likelihood that a decrease in income would cause defaults that would result in increasing the pressure on financial institutions. The difference in the financing of business in the two

TABLE II-7(a)
Nonfinancial Corporations (Billions of dollars)

	Data 1922	Data 1929	Data 1933	Data 1939	Percent 1922	Percent 1929	Percent 1933	Percent 1939	(1929- 1933)	(1933- 1939)
I Liabilities										
1. Payables to financial intermediaries	8.15	9.01	6.58	4.79	6.2	4.9	4.7	3.8	.86	- 2.4
2. Payables to other business	9.95	11.89	7.92	9.40	7.6	6.5	5.7	7.5	1.9	- 4.0
3. Mortgages	24.50	37.10	37.80	29.81	18.6	20.2	27.1	23.7	12.6	.7
4. Bonds and notes	1.82	3.23	.97	2.67	1.4	1.8	.7	2.1	1.4	- 2.3
5. Accruals	9.18	13.17	10.93	4.33	7.0	7.2	7.8	3.4	4.0	- 2.2
6. Other liabilities	53.60	74.40	64.20	51.00	40.8	40.6	46.0	40.6	20.8	-10.2
7. Total	77.88	109.05	75.22	74.59	59.2	59.4	54.0	59.4	31.2	-33.8
II Equities	131.48	183.45	139.42	125.59	100.	100.	100.	100.	52.0	-44.0
III Total Liabilities & Equities										

	(1929- 1933)	(1946- 1939)	Percent 1922	Percent 1929	Percent 1933	Percent 1939	(1946- 1939)	Percent 1922	Percent 1929	Percent 1933	Percent 1939	(1946- 1939)
I Liabilities												
1. Payables to financial intermediaries	- 1.8	1.7	5.5	13.0	1.11	.73	.73	1.11	.73	.73	.73	
2. Payables to other business	1.5	3.7	9.1	10.9	1.19	.67	1.19	1.19	.67	1.19	.67	
3. Mortgages	- 8.0	24.2	1.6	58.0	1.51	1.02	.79	1.51	1.02	.79	.79	
4. Bonds and notes	1.7	2.7	5.2	12.3	1.77	.30	2.75	1.77	.30	2.75	.30	
5. Accruals	- 6.6	7.7	5.0	47.8	1.43	.83	.40	1.43	.83	.40	.40	
6. Other liabilities	-13.2	40.0	23.2	95.7	1.39	.86	.79	1.39	.86	.79	.79	
7. Total	- .6	60.0	76.8	4.3	1.40	.69	.99	1.40	.69	.99	.99	
II Equities	-13.8	100.	100.	100.	1.40	.76	.90	1.40	.76	.90	.90	
III Total Liabilities & Equities												

Note: (1922-39) data not comparable to (1946-58) data.

Source: Raymond W. Goldsmith, A Study of Saving in the United States, Vol. III (Princeton: Princeton University Press, 1956), Table W-31.

TABLE II-7(b)
Nonfinancial Corporations
(Billions of dollars)

	Data 1946	Data 1958	Percent 1946	Percent 1958	Percent 1958- 1946	Percent 1946
I Liabilities						
1. Trade debt	23.45	59.54	8.2	7.9	36.1	7.7
2. Loans on securities	.49	.2	.2			2.54
3. Bank loans n.e.c.	9.13	28.14	3.2	3.7	19.0	4.0
4. Mortgages	9.10	29.22	3.2	3.9	20.1	4.3
5. Bonds and notes	24.36	69.46	8.5	9.2	45.1	9.6
6. Other liabilities	30.16	59.64	10.5	7.9	29.5	6.3
7. Total	96.69	246.00	33.7	32.5	149.3	31.7
II Equities	189.94	511.80	66.3	67.5	321.9	68.3
III Total Liabilities & Equities	286.63	757.80	100.	100.	471.2	100.

Sources: Same as Table II-6(b).

TABLE II-8 (b)
Commercial Banks (Billions of dollars)

	Data 1946	Data 1958	Percent 1946	Percent 1958	(1958- 1946)	Percent (1958- 1946)	1958 1946
I Tangible Assets	1.37	3.48	.9	1.4	2.1	2.3	2.54
II Intangible Assets							
1. Currency and demand deposits	28.53	35.13	19.0	14.5	6.6	7.2	1.23
2. Other bank deposits and shares	.06	.08	.04	.03	.02	.02	1.33
3. Consumer credit	2.66	16.35	1.8	6.8	13.7	15.0	6.15
4. Loans on securities	3.16	4.64	2.1	1.9	1.5	1.6	1.47
5. Bank loans n.e.c.	18.20	53.90	12.1	22.3	35.8	39.2	2.98
6. Mortgages	7.20	25.26	4.8	10.5	18.1	19.8	3.51
7. Securities, U.S. government	74.78	66.18	49.8	27.4	- 8.6	- 9.4	.88
8. Securities, state and local	4.40	16.50	2.9	6.8	12.1	13.2	3.75
9. Securities, other bonds and notes	3.32	3.52	2.2	1.5	.2	.2	1.06
10. Securities, common stock	.19	.19	.1	.08	0		1.00
11. Other intangible assets	6.31	16.25	4.2	6.7	9.9	10.8	2.58
12. Total	148.71	238.07	99.1	98.6	89.3	97.7	1.60
III Liabilities							
1. Currency and demand deposits	104.86	148.52	69.9	61.5	43.7	47.8	1.42
2. Other bank deposits and shares	34.17	65.89	22.8	27.3	31.7	34.7	1.93
3. Bank loans n.e.c.	.04	.07	.02	.03	.03	.03	1.75
4. Other loans	.21	0	.1				
5. Other liabilities	.84	5.68	.6	2.4	4.8	5.3	6.76
6. Total	140.13	220.16	93.4	91.2	80.0	87.5	1.57
IV Equities	9.95	21.34	6.6	8.8	11.4	12.5	2.14
V Total Assets or Liabilities & Equities	150.08	241.50	100.	100.	91.4	100.	1.61

Sources and footnotes: See Table II-6(b).

has increased significantly. No such marked trend in riskiness is evident in the 1920's.

d. Principal savings intermediaries. In Tables II-9 (a) and (b), II-10 (a) and (b) and II-11 (a) and (b) the assets of the principal savings intermediaries, the mutual savings banks, the savings and loan associations and the life insurance companies are presented. The following observations seem relevant:

1) Both during the 1920's and in the period since 1946 the savings and loan associations have been the fastest growing savings intermediary: in the 1920's their total assets grew 165 percent and in the 1946-58 period they grew a phenomenal 441 percent. In the 1920's some 88 percent of their assets were mortgages, in 1946 only 70 percent, but by 1958, 82.3 percent of their total assets were in mortgages.

2) During both the 1920's and in the period since 1946 the mutual savings banks have been the slowest growing financial intermediary; in the 1920's their total assets increased 50 percent and in the 1946-58 period they grew by 102 percent. During the 1920's they decreased their holdings of U.S. government debt from 16.5 to 5.4 of their portfolio, meanwhile increasing their mortgage holdings from 44.4 percent to 55.3 percent of their portfolio. In

the period since 1946 they engaged in a similar switch, although more extreme: in 1946 mortgages were 23.7 percent of their portfolio and U.S. government securities were 62.8 percent; in 1958 mortgages were 61.1 percent of their portfolio and government debt was 19.1 percent.

3) The total assets of life insurance companies increased by 102 percent in the 1920's and by 124 percent in the period since 1946. In 1922, 35.7 percent of the total assets of life insurance companies was in mortgages; in 1929, 41.9 percent was in mortgages. During the 1920's 48.1 percent of the increase in assets was allocated to mortgages. In 1946 only 14.8 percent of the portfolio of life insurance companies was in mortgages; by 1956, 34.2 percent was in mortgages. Mortgages constituted 49.6 percent of the increase in total assets during this period. However in the 1920's this was not due to a switching out of Government bonds, for the life insurance companies held but 1 percent to 2 percent of their assets in Government bonds during that period. In the postwar period U.S. government securities declined from 44.6 percent to 6.6 percent of the portfolio of life insurance companies. As a result, 51.9 percent of the increase in assets of life insurance companies was allocated to securities, other bonds and notes, i.e., to private debt excluding mortgages.

It seems obvious that since 1946 the savings intermediaries have been engaged in a massive shift of their portfolio, choosing to hold the debts of households and business firms rather than the debt of the government. On a much milder scale the mutual savings banks engaged in such a shift during the 1920's. The savings and loan associations and the life insurance companies were in no position to do this during that period because they held very small amounts of Government bonds. There seems little doubt that there is a tendency for the savings intermediaries to increase the riskiness of their portfolio during a sustained boom, although there may be a limiting riskiness which they will accept. Apparently they have been far short of any such limiting portfolio in the period since World War II.

4. Changes in Gross National Product and Selected Balance Sheet Items During Sustained Booms. We have examined the changes in the structure of financial relations that take place during a sustained boom. We will now compare changes in gross national product and personal disposable income (which can be considered as measures of nonfarm households and nonfinancial corporation receipts on income account) during the sustained booms with changes in a few of the items on the balance sheets of nonfarm households and nonfinancial firms. This examination is cursory, but it does indicate that at least selected balance sheet items do on the whole grow

TABLE II-9 (a)

Mutual Savings Banks
(Billions of dollars)

	Data 1922	Data 1929	Data 1933	Percent 1922	Percent 1929	Percent 1933	Percent 1939	Percent 1946- 1959	Percent 1959- 1972	Percent 1972- 1979	Percent 1979- 1999	Percent 1999- 2022	Percent 2022- 2033	Percent 2033- 2046	Percent 2046- 2059	Percent 2059- 2072	Percent 2072- 2085	Percent 2085- 2098	Percent 2098- 2111	
I Tangible Assets	.06	.15	.45	.73	1.0	1.5	4.2	6.2	.09	.30	.48	.58	2.8	33.7	95.7	8.4	2.50	3.00	1.62	.21
II Intangible Assets	.22	.26	.46	.81	3.3	2.6	4.3	6.8	.04	.80	.35	.15	1.2	22.5	32.1	2.2	1.18	1.77	1.76	.81
1. Currency and demand deposits	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Other bank deposits and shares	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3. Consumer credit	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4. Loans on securities	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5. Mortgages	2.93	5.46	5.55	4.84	44.4	55.3	51.6	40.8	2.53	.09	-.71	-.39	77.4	10.1	65.1	5.7	1.86	1.02	.87	.92
6. Securities, U.S. government	1.09	.53	.84	3.10	16.5	5.4	7.8	26.2	-.56	.31	2.26	8.68	-17.1	34.8	207.3	225.8	.49	1.58	3.69	3.80
7. Securities, state and local	.70	.91	.90	.62	1.1	9.2	8.4	5.2	.21	-.01	-.28	-.56	6.4	1.1	25.7	8.1	1.30	.99	.69	.10
8. Securities, other bonds and notes	1.30	2.17	2.32	1.57	20.0	22.0	21.6	13.2	.87	.15	-.75	-.38	26.6	16.9	68.8	5.5	1.67	1.07	.68	.85
9. Securities, common stock	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10. Other intangible assets	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11. Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Assets	6.60	9.87	10.76	11.85	100.	100.	100.	100.	3.27	.89	1.09	6.90	100.	100.	100.	100.	1.50	1.09	1.10	1.58

sources: I. (1922-39) R. W. Goldsmith, *Financial Intermediaries in the American Economy since 1900*, for the National Bureau of Economic Research (Princeton: Princeton University Press, 1969), Table A-6.

2. I. R. W. Goldsmith, *A Study of Saving in the United States*, Vol. 1 (Princeton: Princeton University Press, 1969), Tables L-29, A-41, M-3, M-4.

6, 7) R. W. Goldsmith, *Financial Intermediaries in the American Economy Since 1900*, op. cit., Table A-6.

8, 9) R. W. Goldsmith, *A Study of Saving in the United States*, op. cit., Table L-29.

10, 11) R. W. Goldsmith, *Financial Intermediaries in the American Economy Since 1900*, op. cit., Table A-5.

TABLE II-9(b)

Mutual Savings Banks
(Billions of dollars)

	Data 1916	Data 1958	Percent 1916	Percent 1958	Percent 1958- 1966	Percent 1966- 1976
I Tangible Assets	.15	.32	.8	.8	.17	.9
II Intangible Assets						
1. Currency and demand deposits	.66	.76	3.5	2.0	.10	.5
2. Other bank deposits and shares	.16	.16	.9	.4	0	1.00
3. Consumer credit	.02	.14	.1	.4	.12	.6
4. Loans on securities	*	.01				7.00
5. Mortgages	4.45	23.26	23.7	61.1	18.81	97.3
6. Securities, U.S. government	11.78	7.26	62.8	19.1	-4.52	23.4
7. Securities, state and local	.06	.72	.3	1.9	.66	3.4
8. Securities, other bonds and notes	1.19	4.11	6.3	10.8	2.92	15.1
9. Securities, common stock	.15	.86	.8	2.3	1.71	3.7
10. Other intangible assets	.13	.47	.7	1.2	.34	1.6
11. Total	18.60	37.77	99.2	99.2	19.17	99.1
III Total Assets	18.75	38.09	100.	100.	19.38	100.

Source: Same as Table II-8(b).

TABLE II-10(a)
Savings and Loan Associations (Billions of dollars)

	Data 1922	Data 1929	Data 1933	Data 1939	Percent 1922	Percent 1929	Percent 1933	Percent 1939	Percent 1929- 1933	Percent 1939- 1922	Percent 1939- 1929
I Tangible Assets	.01	.17	.93	.77	.4	2.3	14.9	14.3	.16	.76	
II Intangible Assets											
1. Currency and demand deposits	.10	.17	.14	.27	3.6	2.3	2.2	5.0	.07	.03	
2. Consumer credit	--	--	--	--	--	--	--	--	--	--	
3. Mortgages, non-farm	2.47	6.57	4.68	3.88	88.2	88.7	75.1	72.1	4.10	1.89	
4. Securities, U.S. government	.03	.02	.06	.10	1.1	.3	1.0	1.9	-.01	.04	
5. Other intangible assets	--	--	--	--	--	--	--	--	--	--	
6. Total	--	--	--	--	--	--	--	--	--	--	
III Total Assets	2.80	7.11	6.23	5.38	100.	100.	100.	100.	4.61	1.18	
I Tangible Assets	(1916- 1933)	(1916- 1939)	(1922- 1929)	(1922- 1933)	(1916- 1933)	(1916- 1939)	(1922- 1933)	(1922- 1939)	(1916- 1933)	(1916- 1939)	
II Intangible Assets											
1. Currency and demand deposits	.13	.20	1.5	2.5	15.3	4.1	1.70	.82	1.93	1.74	
2. Consumer credit	--	--	--	--	--	--	--	--	--	--	
3. Mortgages, non-farm	.80	3.26	88.9	160.2	94.1	67.1	2.66	.71	.83	1.84	
4. Securities, U.S. government	.04	1.91	.2	3.4	4.7	39.3	.67	3.00	1.67	20.1	
5. Other intangible assets	--	--	--	--	--	--	--	--	--	--	
6. Total	--	--	--	--	--	--	--	--	--	--	
III Total Assets	.85	4.86	100.	100.	100.	100.	2.65	.84	.86	1.90	

Sources: 1. (1929-39) I: R. W. Goldsmith, Financial Intermediaries in the American Economy since 1900, for the National Bureau of Economic Research (Princeton: Princeton University Press, 1959), Table A-19.
 2. II: 1, 3) R. W. Goldsmith, A Study of Saving in the United States, Vol. I (Princeton: Princeton University Press, 1955), Tables J-2, M-3, M-8.
 3. 4) R. W. Goldsmith, Financial Intermediaries in the American Economy since 1900, op. cit., Table A-19.
 III: Ibid.

TABLE II-10(b)
Savings and Loan Associations
(Billions of dollars)

	Data 1946	Data 1958	Data 1966	Percent 1946	Percent 1958	Percent 1966	Percent 1958- 1966	Percent 1966- 1946
I Tangible Assets	.14	1.15	1.4	2.1	1.01	2.2	8.21	
II Intangible Assets								
1. Currency and demand deposits	.47	1.75	4.6	3.2	1.28	2.8	3.72	
2. Consumer credit	.06	.70	.6	1.3	.64	1.4	11.67	
3. Mortgages, non-farm	7.14	45.60	69.7	82.3	38.46	85.1	6.39	
4. Securities, U.S. government	2.01	3.82	19.6	6.9	1.81	4.0	1.90	
5. Other intangible assets	.43	2.40	4.2	4.3	2.97	4.4	5.58	
6. Total	10.11	54.27	98.7	97.9	44.16	97.7	5.37	
III Total Assets	10.24	55.42	100.	100.	45.18	100.	5.41	

Source: Same as Table II-6(b).

TABLE II-11(a)

Life Insurance Companies
(Billions of dollars)

	Data 1922	Data 1929	Data 1933	Data 1939	Percent 1922	Percent 1929	Percent 1933	Percent 1939	Percent 1922- 1929	Percent 1929- 1933	Percent 1933- 1939	Percent 1939- 1946- 1933	Percent 1946- 1939	Percent 1922- 1929	Percent 1929- 1933	Percent 1933- 1939	Percent 1939- 1946- 1933	Percent 1946- 1959	Percent 1959- 1966
Tangible Assets	.20	.46	1.76	2.13	2.3	2.6	6.0	7.3	.86	.80	.87	.26	.26	7.9	23.4	30.4	1.4	7.30	7.74
Intangible Assets																			
1. Currency and demand deposits	.13	.15	.32	.93	1.5	.9	1.5	3.2	.02	.17	.61	.16	.16	.2	5.0	7.3	.9	1.15	2.13
2. Mortgages	3.09	7.34	6.72	5.76	35.7	41.9	32.2	19.7	4.25	.62	.96	1.40	1.40	18.1	18.1	11.5	7.7	2.38	.92
3. Securities, U.S. government	.08	.54	.86	5.40	1.0	1.9	4.1	10.5	.54	.52	4.58	16.23	6.1	15.2	54.4	89.1	.39	2.53	6.78
4. Securities, state and local	.36	.57	.86	1.76	.4	3.3	4.1	6.0	.21	.29	.90	1.15	2.4	8.5	10.8	6.3	1.58	1.51	2.05
5. Securities, other bonds and notes	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6. Securities, preferred stock	.08	.35	.54	.57	.1	2.0	2.6	1.9	.27	.19	.03	.68	3.1	5.6	.4	3.7	4.38	1.54	2.19
7. Securities, common stock	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8. Other intangible assets	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9. Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Assets	8.65	17.48	20.90	29.24	100.	100.	100.	100.	8.83	3.42	8.34	18.22	100.	100.	100.	100.	2.02	1.80	1.46

Source: 1. (1922-29) E. R. Goldsmith, *Financial Intermediaries in the American Economy since 1900*, for the National Bureau of Economic Research (Princeton: Princeton University Press, 1959), Table A-4.

2. E. R. W. Goldsmith, *A Study of Saving in the United States*, Vol. 1 (Princeton: Princeton University Press, 1955), Tables 1-5, A-61, M-3, M-4.

3. 4, 5, 6, 7) E. R. W. Goldsmith, *Financial Intermediaries in the American Economy since 1900*, pp. 62, Table A-3.

8) *ibid.*

TABLE II-11(b)

Life Insurance Companies
(Billions of dollars)

	Data 1946	Data 1958	Percent 1946	Percent 1958	Percent (1958- 1946)	Percent (1958- 1946)
I Tangible Assets	1.00	4.53	2.1	4.2	3.5	5.8
II Intangible Assets						
1. Currency and demand deposits	.77	1.37	1.6	1.3	.6	1.0
2. Mortgages	7.16	37.07	14.8	34.1	29.9	19.6
3. Securities, U.S. government	21.63	7.18	44.6	6.6	-14.5	-24.0
4. Securities, state and local	.61	2.68	1.3	2.5	2.1	3.5
5. Securities, other bonds and notes	13.11	44.37	27.1	40.8	31.3	51.9
6. Securities, preferred stock	.97	1.56	2.0	1.4	.6	1.0
7. Securities, common stock	.28	2.55	.6	2.3	2.3	3.8
8. Other intangible assets	2.93	7.15	6.0	6.9	4.5	7.5
9. Total	47.16	104.22	97.9	95.8	56.8	94.2
III Total Assets	48.16	108.75	100.	100.	60.3	100.

Source: Same as Table II-6(b).

more rapidly than income during sustained booms.⁸ Hence the proposition that during a sustained boom the probability increases that a decline in income will lead to difficulties in meeting balance sheet commitments is not at first glance inconsistent with the observations.

During the 1922-29 sustained boom gross national product rose by 41 percent and personal disposable income by 38 percent. The 1922-29 sustained boom was characterized by well-nigh stable prices; the Gross National Product Implicit Price Index increased by only 2 percent during this period. Nonfarm household debts increased by 129 percent, but business debts increased by only 39 percent. The burden of household debts relative to household disposable income increased during the 1922-29 boom, but the ratio of business debts to gross national product did not. This behavior of business debt may have a reflection of the stock market boom, which the 80 percent increase in the nonfarm households intangible asset entry reflects.

During the 1946-58 sustained boom gross national product rose by 111 percent and personal disposable income by 98 percent. This boom was accompanied by a 49 percent rise in the Gross National Product Implicit Price Level. This price level change tends to decrease the burden of longer-term debt. Nevertheless the rate of increase of all of the household debt items was greater — in all except one case (other loans) much greater — than the rate of increase of gross national product. Similarly liabilities of non-financial corporations — with one exception (other liabilities) — increased at a more rapid rate than gross national product.

Further work on the interrelations among financial developments and income behavior is obviously needed before any strong presumption exists in favor of the proposition regarding the evolutions of balance sheets which has been used in this paper. However these preliminary empirical findings are not inconsistent with the proposition.

C. Balance Sheet Changes during a Severe Contraction and the Subsequent Stagnation

1. Introduction. In this section we want to take a brief glance at what happened to the balance sheets of various classes of economic units during the period 1929-39, the period of the great contraction of 1929-33 and the subsequent stagnation that lasted until the outbreak of World War II.

⁸In Tables II-6(a) through II-11(b) data and ratios of 1929/1922 and 1958/1946 observations for selected balance sheet items for all the units we discussed are presented.

TABLE II-12

Changes in Gross National Product and Selected Balance Sheet Items
Nonfarm Households and Nonfinancial Business
During Sustained Booms 1922-29 and 1946-58

(Billions of Dollars)

	1922	1929	1946	1958	1 ratios	
					1929 1922	1958 1946
Gross National Product (current prices)	74.0	104.4	210.7	444.6	1.41	2.11
Personal Disposable Income (current prices)	60.3	83.1	160.6	317.9	1.38	1.98
Gross National Product (constant prices)	75.8	104.4	232.5	401.0	1.38	1.77
Gross National Product Implicit Price Index 1922-29 (1929 = 100) 1946-58 (1954 = 100)	98	100	74.6	110.8	1.02	1.49
<u>Nonfarm Households:</u>						
Tangible assets	108.86	164.82	239.91	631.98	1.51	2.63
Intangible assets	158.84	285.43	400.04	875.32	1.80	2.19
Borrowing on securities	4.53	11.58	1.78	6.01	2.56	3.41
Consumer Debt	na	na	8.00	44.31	na	5.54
Mortgages	9.97	23.27	19.24	112.28	2.33	5.83
Total liabilities	22.14	50.75	32.10	170.79	2.29	5.32
<u>Nonfinancial Corporations:</u>						
Mortgages, Bonds & Notes	24.50	37.10	33.46	98.68	1.51	2.96
Total liabilities	53.60	74.40	96.69	246.00	1.39	2.54

na: not available

All of the data referred to in this section appear in Tables II-6(a) through II-11(a).

During the period 1929-33, the great liquidation of the boom of the 1920's took place, but it was only in the period 1933-39 that a significant increase in liquidity took place. As a result, it was not until the war was over that a privately generated sustained boom could once again exist. During the great contraction, the shrinkage in the value of equity and real estate assets actually increased on measure of the constraints imposed by debt and the great decline in income (measured in current dollars) increased another. As a result some business firms and financial institutions had to use the period after the contraction to establish a secure financial position. As shall be seen, this is in contrast with what happens in mild recessions when over-all financial positions tend to be improved.

2. Nonfarm Households. Between 1929 and 1933 the total value of tangible assets of nonfarm households shrank from \$164.8 billion to \$121.0 billion; by 1939 the value of household tangible assets increased to \$145.4 billion. This great shrinkage in the value of tangible assets was accompanied by a greater absolute and relative shrinkage in the value of intangible assets. The greatest shrinkage in the value of assets occurred in the value of securities, preferred and common stock, which fell from \$138.05 billion in 1929 to \$57.06 billion in 1933.

All in all the value of nonfarm household assets was decreased by 134.4 billion or 30 percent of the 1929 value. It was argued in Chapters III and IV that such a shrinkage and the processes which bring it about are essential factors in the generation of a severe recession.

In 1929, common and preferred stocks were 30.7 percent of the total assets of nonfarm households; by 1933 they were only 18.1 percent and by 1939 they were 19.5 percent. Tangible assets plus common and preferred stock were 67.3 percent of the nonfarm households total assets in 1929; in 1933 these two added up to 56.4 percent of the total assets. The proportion of the total value of assets that was subject to severe depreciation decreased as the liquidation proceeded.

During 1929-33 the large losses taken on real estate and equity assets resulted in a decrease in the ratio of equity to total assets, so that by 1933 debt was 12.2 percent of total household assets. During the subsequent period of stagnation total household debt hardly grew, so that by 1939 household debt was 10.4 percent of total assets.

Of the decrease in household debt of \$12.1 billion between 1929 and 1933, \$7.6 billion was a decrease in borrowing on securities and \$3.6 billion was in mortgages.

As a result of the changes that occurred in the financial position of households during the period 1929-33 and through to 1937, the proportion of price vulnerable assets to total assets decreased. The ratio of debt to total assets decreased and the debt based upon securities and mortgages fell sharply. As a result, the households' financial position changed in the direction of increased security and stability during this period.

3. Nonfinancial Corporations. Whereas the total assets of households increased by 19 percent between 1933 and 1939, the total assets of nonfinancial corporations decreased by 10 percent. The stagnation of the 1933-39 period was reflected in the value of assets of nonfinancial business.

Between 1929 and 1933 the ratio of equity liabilities to total assets fell from 59.4 percent to 54.0 percent. During the second phase of the great depression, nonfinancial business continued to liquidate their mortgage and bond debts, so that by 1939 once again equity was 59.4 percent of their total assets. There is no doubt that the shrinkage in the value of tangible assets, which affected the ownership interest in corporations, accounted for a part of the rise in the ratio of bonds, notes and mortgages from 20.2 percent to 27.1 percent of corporation total liability and equity accounts. However, between 1929 and 1933 the total value of these funded liabilities, mortgage and corporate bonds did not decrease. During the great contraction short-term debt was being funded and long-term debt was being refinanced.

During a severe contraction the relative burden of long-term debt on business firms increases. If the contraction is deep, then once the economy is stabilized at the lower level a fairly long period of "working off" the burdensome debt may be needed before nonfinancial business will be ready once again to issue long-term debt: during the stagnant period, 1933-39, the long-term debt of nonfinancial corporations was lowered by \$8.0 billion.

4. Commercial Banks. Between 1929 and 1933 total assets of commercial banks decreased by \$25 billion; \$17.69 billion of this \$25 billion was a reduction in loans in securities and bank loans n.e.c. This was the banking sector's contribution to the great contraction. Between 1933 and 1939 total assets rose by \$24.4 billion, so that by 1939 total assets of the banking system were virtually the same as in 1929.

Of course the portfolio of the banking system changed markedly during this period. In 1929, 45.4 percent; in 1933, 29.8 percent; and in 1939, 19.9 percent of the total assets were loans on securities and bank loans n.e.c. In 1929, 7.1 percent; in 1933, 19.5 percent; and in 1939, 25.1 percent of the total assets were in U.S. government securities. However the most dramatic change was in the currency and demand deposit (reserve) accounts; in 1929 they were 10.1 percent; in 1933 they were 14.4 percent; and in 1939 they were 31.7 percent of total assets. Using currency and demand deposits and U.S. government securities as the riskless assets of the banking system, in 1929 riskless assets were 17.7 percent; in 1933 they were 33.9 percent and in 1939 they were 56.8 percent of the commercial bank's total assets.

During the recession and stagnation periods of the 1930's, the commercial banks increased their liquidity.

5. Principal Savings Intermediaries. Both mutual savings banks and life insurance companies increased their total assets during the

period 1929-33 and again from 1933 to 1939. However the total assets of the savings and loan associations decreased by 16 percent between 1929 and 1933 and by another 14 percent between 1933 and 1937.

There were relatively slight changes in the asset composition of the mutual savings banks during the contraction of 1929-33. Tangible assets increased from 1.5 percent to 4.2 percent of the portfolio; mortgages decreased from 55.3 to 51.6 percent of the portfolio; and Government bonds rose from 5.4 percent to 7.8 percent. There were marked changes in the portfolio of mutual savings banks during the stagnation period 1933-39: mortgages fell to 40.8 percent; U.S. government securities rose to 26.2 percent; and other securities fell to 13.2 percent. The reduction in the mortgage portfolio and the large increase in government debt holdings was the response of the mutual savings banks during the stagnation.

The proportion of tangible assets to total assets for savings and loan associations rose from 2.3 percent in 1929 to 14.9 percent in 1933 and remained high to 1939 when it was 14.3 percent. These developments were the result of foreclosures. Even in 1939, 86.4 percent of the total assets of these associations was in mortgages or tangible assets. They did not succeed in becoming appreciably more liquid during the period 1929-39, which may account for the continuing decline in their total assets during the 1933-39 period.

The percentage of tangible assets to total assets also rose for life insurance companies between 1929 and 1939: from 2.6 percent in 1929 to 6.0 percent in 1933 and 7.3 percent in 1939. However they did make large changes in their mortgage and U.S. government holdings: mortgages fell from 41.9 percent to 32.9 percent to 19.7 percent of their portfolio and U.S. government securities rose from 1.9 percent to 4.1 percent to 18.5 percent of their portfolio.

D. Financial Relations during Expansions and Contractions Contained in a Sustained Boom

1. Introduction. Quarterly flow-of-funds data are available for the period 1952-59. Annual data do not enable us to observe what happens to financial relations during the short and mild contractions and the long and strong expansions that occur during a period which we have characterized as a sustained boom. As a result we are forced to restrict our attention to the postwar sustained boom in this attempt to find out what happens within the sustained boom.

We use the National Bureau's "Reference Cycle" pattern as our frame of reference. No attempt is made to uncover specific cycles through the various measures that will be applied. We deviated from the National Bureau reference cycle pattern in only

one respect, we took as our peak quarter the quarter in which the peak month occurs, and similarly for the trough. No rationalization for this is offered except that it seems a more consistent usage of what at best is a rather imprecise framework given the roughness of the data.

Each expansion contains the terminating peak quarter. Each contraction contains the terminating trough quarter. In order to utilize all the data available we literally "broke into" the expansion that began in 1950:1 after it had been underway for two years, and began our tables with the second part of the 1950:1 - 1953:3 expansion, i.e., our first expansion is from 1952:1 to 1953:3. Similarly at the end of our period, the expansion that began in 1958:3 continued through 1959:4 at which date our data terminated.

But with these limitations in mind and recognizing that the further collection of quarterly flow-of-funds data will enable the development of longer and more meaningful series of relations among the financial sectors, we proceed to examine what happened during these mild cycles. Our detailed analysis will be for the following sectors: Households, (including nonprofit organizations), Nonfinancial Business, Commercial Banking and Monetary Authorities, and Nonbank Financial Institutions.

The analysis that follows is directed toward understanding what changes take place during the contained expansions and contractions in the balance sheet structure of the various units: the portfolio transformations and the issuance of new liabilities in the terminology of Chapter IV.

2. Consumers and Nonprofit Households. Household gross investment includes both the purchase of durable goods and housing, which "being" netted for all households result in income account payments and an increase in the balance sheet entry of "tangible assets owned by households" and the net acquisition of financial investments. During the period 1952:1 through the end of the contraction of 1958:2 there was an apparent rising trend in the ratio of household capital expenditure to household gross investment; during the "truncated" expansion, 1958:3 - 1959:4, the ratio of financial investment rose.

The ratio of increases in fixed value redeemable assets to net acquisition of financial assets shows a countercyclical pattern: higher during the contractions than during the expansion. Apparently during recessions time deposits and savings and loan shares become "preferred" assets by households. Running counter to the behavior of fixed value redeemable assets are credit and equity market instruments which exhibit a cyclical pattern.

TABLE II-13

Includes Tables II-13(a) to (e)

FINANCIAL RELATIONS DURING EXPANSIONS AND CONTRACTIONS
CONTAINED IN A SUSTAINED BOOM, 1952-59¹
(Billions of Dollars)

Consumer and Nonprofit Organizations

	Expansion 52:1-53:3	Contraction 53:4-54:3	Expansion 54:4-57:3	Contraction 57:4-58:2	Expansion 58:3-59:4
1. Current Receipts	456.9	271.0	927.6	248.7	532.1
2. Current Receipts after Deductions	390.7	235.7	797.4	214.7	460.7
3. Current Expenditures for Goods & Services	306.3	184.9	622.8	172.2	364.4
4. Net Saving	42.3	24.7	83.3	16.3	44.2
5. Gross Saving	92.7	55.5	191.9	47.2	108.3
6. Gross Investment	94.3	55.7	201.9	47.7	115.7
7. Capital Expenditures	76.9	46.5	172.7	42.0	95.2
8. Residential Construction	20.1	12.3	47.7	10.7	26.5
9. Consumer Durables	53.1	31.7	116.7	28.7	63.3
10. Net Financial Institutions	17.5	9.2	29.0	5.7	20.6
11. Acquisition of Financial Assets	38.1	19.1	78.4	13.6	49.1
12. Currency and Demand Deposits	.7	2.1	.6	.8	5.8
13. Fixed Value Redeemable Assets	13.6	8.9	27.3	9.9	16.2
14. Time Deposits	7.5	4.1	13.2	5.5	7.5
15. Savings Shares	6.1	4.4	15.6	4.9	10.5
16. U.S. Savings Bonds	—	.4	1.1	.6	2.2
17. Savings through Life Insurance	5.3	3.1	9.9	2.2	5.5
18. Credit and Equity Institutions	8.4	4.1	25.4	1.6	18.9
19(a). Federal Obligations	1.5	3.1	6.1	2.9	10.4
19(b). Corporate Stock	2.8	.8	4.8	1.6	2.2
20. Net Inc. in Liabilities	20.4	9.9	49.3	7.9	28.6
21. Mortgages	12.4	7.8	33.3	6.5	19.3
22. Consumer Credit	7.2	.8	12.7	.1	8.3
23. Security Credit	.6	.9	1.2	.8	.5

¹Source for Tables II-13(a)-(e): Federal Reserve System Flow of Funds Supplements and August 1969 Federal Reserve Bulletin. The data worked with here are presented in Table 4: Sector Statement of Sources and Uses of Funds.

TABLE II-13(b)
Corporate Nonfinancial Business

	Expansion 52:1-53:3	Contraction 53:4-54:3	Expansion 54:4-57:3	Contraction 57:4-58:2	Expansion 58:3-59:4
1. Net Saving	10.1	14.0	25.3	-2.0	18.8
2. Gross Saving	32.0	15.8	81.3	13.6	52.8
3. Gross Investment	31.9	11.7	74.7	12.4	43.8
4. Capital Expenditures	41.8	19.3	93.6	17.0	43.2
5. Change in Inventory	4.1	-3.0	11.3	-3.9	1.9
6. Net Financial Investment	-9.8	-7.5	24.1	-4.5	.7
7. Net Acquisition of Financial Assets	7.3	.1	26.7	-3.3	25.2
8. Currency and Demand Deposits	.5	.7	1.5	-.5	3.7
9. Federal Obligations	-.3	-2.3	-1.3	-2.8	8.4
10. Trade Credit	5.0	.6	21.4	-2.6	10.0
11. Net Increase in Liabilities	17.2	7.4	45.8	1.3	24.5
12. Credit and Equity Market Instruments	16.0	5.9	30.7	6.4	14.3
13. Corporate Bonds	6.9	4.2	11.7	4.8	6.0
14. Corporate Stock	3.7	1.7	6.4	1.7	3.6
15. Mortgages	2.3	1.6	5.3	1.5	4.9
16. Bank Loans, n.e.c.	2.9	-1.5	6.4	-1.9	.5
17. Trade Debt	.9	1.3	14.8	-5.2	10.2

TABLE II-13(c)
Commercial Banks and Monetary Authorities Sector

	Expansion 52:1-53:3	Contraction 53:4-54:3	Expansion 54:4-57:3	Contraction 57:4-58:2	Expansion 58:3-59:4
1. Net Financial Investment	1.8	.8	3.2	.2	2.3
2. Net Acquisition of Financial Assets	11.1	6.1	17.9	12.1	11.0
3. Gold	-.6	-.4	.8	-1.4	-1.9
4. Credit Market Instruments	11.6	6.3	17.0	13.2	12.6
5. Federal obligations	2.0	3.9	-10.1	8.9	-4.3
6. Monetary Authorities	1.4	-1.0	-.9	2.1	1.3
7. Commercial Banks	.5	4.8	-9.2	6.8	-5.6
8. Short-term Direct	7.6	-3.4	-5.0	-.5	-2.1
9. Other Direct and Guaranteed	-7.0	8.3	-4.4	5.9	-3.2
10. State and Local Obligations	1.6	1.6	1.2	2.3	1.2
11. Corporate and Foreign Bonds	--	-.2	-.6	.2	-.3
12. Mortgages	1.9	1.1	5.1	.9	4.0
13. Consumer Credit	3.5	-.1	4.7	-.1	2.7
14. Security Loans	.2	1.1	.3	1.4	-.5
15. Bank Loans, n.e.c.	2.5	-1.8	17.1	-.9	10.4
16. Net Increase in Liabilities	9.4	5.4	15.0	11.9	8.6
17. Demand Deposits and Currency	3.9	.9	6.2	4.3	5.6
18. Demand Deposits Due to Others, Net	-.3	3.8	3.2	1.6	8.2
19. Currency Due to Others, Net	1.1	-.6	1.0	.1	1.5
20. Time Deposits	5.3	4.6	8.1	7.4	2.8

TABLE II-13(d)

Federal Government Sector

	Expansion 52:1-53:3	Contraction 53:4-54:3	Expansion 54:4-57:3	Contraction 57:4-58:3	Expansion 58:3-59:4
1. Gross and Net Savings	-3.6	-3.0	9.3	-.2	-17.5
2. Acquisition of Mortgages	1.1	-.1	1.8	.3	2.5
3. Net Increase in Liabilities	10.1	.1	-1.6	-3.2	20.5
4. Federal Obligations	8.2	-.8	-1.1	2.4	20.2
5. Short-term and Direct	16.7	-2.8	6.3	-4.0	10.5
6. Other Guaranteed	-8.6	2.0	-10.6	6.3	6.8

TABLE II-13(e)

Nonbank Financial Sector

By sub-sector	Expansion				Contraction				Expansion			
	52:1-53:3	53:4-54:3	54:4-55:3	55:4-56:3	57:4-58:2	58:3-59:4	59:5-60:4	60:5-61:4	62:5-63:4	63:5-64:4	64:5-65:4	65:5-66:4
1. Net Acquisition of Financial Assets	27.8	17.4	58.6	58.6	15.9	34.4	34.4	34.4	34.4	34.4	34.4	34.4
By Type												
2. Mutual Savings Banks	3.3	1.9	6.0	6.0	1.9	2.6	2.6	2.6	2.6	2.6	2.6	2.6
3. Savings & Loan Assn's. & Credit Unions	7.0	4.9	17.5	17.5	4.8	12.5	12.5	12.5	12.5	12.5	12.5	12.5
4. Life Insurance Companies	7.9	5.0	15.4	15.4	3.6	8.1	8.1	8.1	8.1	8.1	8.1	8.1
5. Other Insurance Companies	2.8	1.4	2.7	2.7	.6	2.3	2.3	2.3	2.3	2.3	2.3	2.3
6. Noninsured Pension Funds	2.6	1.8	6.4	6.4	1.9	4.3	4.3	4.3	4.3	4.3	4.3	4.3
7. Finance, n.e.c.	4.3	2.4	10.2	10.2	2.8	4.7	4.7	4.7	4.7	4.7	4.7	4.7
8. Currency and Demand Deposit	-	.5	1.1	1.1	1.0	.1	.1	.1	.1	.1	.1	.1
9. Credit & Equity Market Instruments	27.5	16.3	57.2	57.2	11.0	34.6	34.6	34.6	34.6	34.6	34.6	34.6
10. Federal Obligations	.2	.8	-	-	.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3
11. State and Local Obligations	1.1	1.7	2.8	2.8	1.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8
12. Corporate and Foreign Bonds	7.8	4.2	10.1	10.1	4.1	6.0	6.0	6.0	6.0	6.0	6.0	6.0
13. Corporate Stock	2.1	1.7	5.0	5.0	1.5	3.9	3.9	3.9	3.9	3.9	3.9	3.9
14. 1-4 Family Mortgages	9.5	7.0	25.7	25.7	5.1	14.5	14.5	14.5	14.5	14.5	14.5	14.5
15. Other Mortgages	2.5	1.5	4.9	4.9	1.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2
16. Consumer Credit	3.4	.6	6.3	6.3	.3	2.6	2.6	2.6	2.6	2.6	2.6	2.6
17. Security Credit	.3	.6	1.0	1.0	.4	.2	.2	.2	.2	.2	.2	.2
18. Other Loans	.6	-	3.1	3.1	.6	1.3	1.3	1.3	1.3	1.3	1.3	1.3
19. Other Financial Assets	.6	.6	.5	.5	.8	.5	.5	.5	.5	.5	.5	.5
20. Net Increase in Liabilities	23.2	14.2	52.0	52.0	14.6	30.7	30.7	30.7	30.7	30.7	30.7	30.7
21. Deposits in N.S.B.	3.1	1.8	5.3	5.3	1.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1
22. Savings Shares	6.1	4.5	15.6	15.6	4.9	10.4	10.4	10.4	10.4	10.4	10.4	10.4
23. Savings Through Life Insurance	5.2	3.4	9.8	9.8	2.2	5.3	5.3	5.3	5.3	5.3	5.3	5.3
24. Savings Through Pension Funds	4.6	2.9	10.4	10.4	3.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7
25. Credit and Equity Market Instruments	3.7	1.3	9.6	9.6	2.1	6.0	6.0	6.0	6.0	6.0	6.0	6.0
26. Corporate Bonds	1.5	.3	3.1	3.1	.4	.9	.9	.9	.9	.9	.9	.9
27. Corporate Stock	.8	.4	3.2	3.2	1.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5
28. Securities Credit	-	1.1	2.2	2.2	1.2	1.8	1.8	1.8	1.8	1.8	1.8	1.8
29. Bank Loans, n.e.c.	.7	.4	.2	.2	.5	.5	.5	.5	.5	.5	.5	.5
30. Open Market Paper	.7	-	2.3	2.3	1.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8
31. F.H.L.B. Loans to Savings & Loan Assoc.	-	-	.3	.3	-	.3	.3	.3	.3	.3	.3	.3
32. Miscellaneous	.2	.2	.9	.9	1.2	.6	.6	.6	.6	.6	.6	.6

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The proportion of the net increase in liabilities that is made up of mortgages follows a countercyclical pattern, whereas the ratio of the change in consumer credit to the net increase in liabilities is higher during expansions than in contractions.

Perhaps most interesting of all the "small" cycle observations in regard to household finances is that the increase in liabilities as a fraction of net savings is higher during the expansions than during contractions. Also the limited observations available in Table II-14 show an increasing trend in the ratio during both expansions and contractions: the ratio during the successive expansions being .482, .592 and .647 and during the contractions .401 and .485. When we recall that in 1958 household liabilities were but 11.3 percent of household total assets (Table II-6(b)); the two sets of tables are not strictly the same but similar enough for our purposes, this indicates that if a sustained boom is maintained for a considerable period, the burden of household liabilities relative to both income and total assets will rise sharply.

The evidence from this examination of the behavior of household financial structure during the sustained boom is consistent with the hypothesis that the financial system evolves during such a period in the direction of greater instability.

3. Corporate Nonfinancial Business. Corporate nonfinancial businesses finance their net investment by their retained earnings and the issuance of various liabilities. The liabilities corporations issue are both equities (common stock) and debts. The debts can be divided into two types: "funded or long-term debts" such as corporation bonds and mortgages and short-term debt such as bank loans n.e.c. and trade debt.

The evidence from the financial behavior of nonfinancial corporations indicates that during expansions the ratio of the increase in corporation debts to net saving and issuance of corporate stock is about 1:1, but that during the contraction of 1953:4 - 1954:3 the increase in selected liabilities was twice as great as the increase in owners' equity through retained earnings and issuance of corporate stock. In the contraction of 1957:4 - 1958:2 both net savings plus the issuance of corporate stock and net increase in selected liabilities were negative.

Long-term debt (corporate bonds plus mortgages) runs from 44 percent to 71 percent of the increase in selected liabilities during the expansions. During both contractions the increase in long-term debt was greater than the change in the selected liabilities.

A strong countercyclical movement in the percentage of corporate bonds as a percentage of total credit and equity market liabilities is evident. Corporate stock issuance seems to have a

TABLE II-14

Financial Relations During Expansions and Contractions Contained in a Sustained Boom, 1952-1959
Consumer and Nonprofit Organizations
Selected Ratios from Flow-of-Funds Data

	Expansion 52:1-53:3	Contraction 53:4-54:3	Expansion 54:4-57:3	Contraction 57:4-58:2	Expansion 58:3-59:4
The following as a fraction of gross investment:					
Capital Expenditures	.815	.835	.855	.881	.823
Net Finance Investment	.185	.165	.145	.119	.178
The following as a fraction of "net acquisition of financial assets":					
Currency and Demand Deposits	.018	.110	-.008	-.059	.118
Fixed Value Redeemable Assets	.357	.466	.348	.728	.330
Time Deposits	.197	.215	.168	.404	.153
Savings Shares	.160	.230	.199	.360	.214
U.S. Savings Bonds	---	.021	-0.14	-0.44	-.045
Savings through Life Insurance	.139	.162	.126	.162	.112
Credit and Equity Instruments	.220	-.005	.324	.118	.395
The following as a fraction of "net increase in liabilities":					
Mortgages	.608	.787	.675	.823	.675
Consumer Credit	.353	.081	.258	-.013	.290
Security Credit	.029	.091	.024	.101	-.017
Net increase in liabilities as fraction of "net savings":	.482	.401	.592	.485	.647

TABLE II-15

Financial Relations During Expansions and Contractions Contained in a Sustained Boom, 1952-59
Corporate Nonfinancial Business

	Expansion 52:1-53:3	Contraction 53:4-54:3	Expansion 54:4-57:3	Contraction 57:4-58:2	Expansion 58:3-59:4
	Billions of Dollars				
Net Savings and Issuance of Corporate Stock	13.8	2.7	31.7	-.3*	22.4
Increase in Selected Liabilities*	13.0	5.6	38.2	-.8*	20.6
Increase in Long Term Debt	9.2	5.8	17.0	6.3	10.9
Ratio of Net to Gross Savings	.316	.063	.311	+	.356
Ratio of Increase in Selected Liabilities to Net Saving and Issuance of Corporate Stock:	.942	2.074	1.205	+	.920
Ratio Increase in Long Term Debt to Increase in Selected Liabilities:	.708	1.036	.445	+(.56.3)	.529
Liabilities Issued by Type as a Percentage of Total Credit and Equity Market Liabilities Issued:					
Corporate Bonds	43	71	38	75	42
Corporate Stock	23	29	21	27	25
Mortgages	14	27	17	23	34
Bank Loans n.e.c.	18	-25	21	-30	-3

* Selected liabilities include corporate bonds, mortgages, bank loans n.e.c. and trade debt.

† During the contraction of 1957:4-1958:2 net savings was \$-2.0 Billions, gross savings \$13.6 Billions; corporate bonds and mortgages totaled +\$6.3 Billions and bank loans n.e.c. plus trade debt totaled -\$7.1 Billions.

Bank loans n.e.c. show a tendency to conform with the cycle, being about 20 percent of the credit and equity market liabilities issued by nonfinancial corporations in the first two expansions of this period, and -25 percent and -30 percent of the credit and equity market liabilities during the contraction. However in the third, truncated, expansion bank loans n.e.c. decreased.

There is some evidence that the ratio of the increase in selected liabilities to the change in ownership interest rises during these sustained booms, primarily due to the much smaller magnitude of the data during the contractions than during the expansions.

The evidence from the behavior of long-term debt may indicate that some corporations resort to the short-term money market whenever long-term rates are high, and they fund this short-term debt during the following recession.

4. Commercial Banking System and Monetary Authorities. We will first examine the behavior of the changes that take place in the portfolios of the Commercial Banking System and Monetary Authorities during the expansions and contractions that occur in the midst of a sustained boom. We will consider gold and federal government debt as riskless assets and state and local obligations, corporation and foreign bonds, mortgages, consumer credit, security loans and bank loans n.e.c. as risk assets. There are two reasons for this classification: one is that "default" risk possibilities are attached to the risk assets, the other is that the risk assets are determinants of the behavior of the issuing units whereas the riskless assets do not significantly affect the behavior of their "issuing" unit.

During the business cycle expansions the ratio of risk assets acquired to the net acquisition of financial assets for the monetary and banking system is high; in fact during the last two expansions the banking and monetary system's holdings of riskless assets decreased. Inasmuch as the system increased its holdings of risk assets during both contractions and expansions, Table II-16 offers evidence that the ratio of risk assets to total assets owned by the banking and monetary system increases during a sustained boom. The pattern being followed seems to be to acquire riskless assets (government securities, short-term) during contractions and to sell these assets during expansions in order to finance the acquisition of risk assets.

Among the risk assets the most striking cyclical pattern is that of bank loans n.e.c. Such loans actually decreased during the contractions of 1953:4 - 1954:3 and 1957:4 - 1958:2, and during the last two expansions they were approximately 60 percent of the total assets acquired.

TABLE II-16

Financial Relations During Expansions and Contractions Contained in a Sustained Boom, 1952-1959
Commercial Banking System and Monetary Authorities

	Expansion 52:1-53:3	Contraction 53:4-54:3	Expansion 54:4-57:3	Contraction 57:4-58:2	Expansion 58:3-59:4
	Billions of Dollars				
Net Acquisition of Financial Assets	11.1	6.1	17.9	12.1	11.0
Riskless Assets (& Federal Oblig.)	1.4	3.5	- 9.3	7.5	- 6.2
Risk Assets*	9.7	1.7	27.8	3.8	17.5
The Following as a Fraction of "Risk Assets":					
State and Local Obligations	.165	.941	.043	.605	.069
Corporate and Foreign Bonds	---	-.118	-.022	-.053	-.017
Mortgages	.196	.647	.183	.237	.229
Consumer Credit	.361	-.059	.169	-.026	.154
Security Loans	.021	.647	.010	.368	-.029
Bank Loans, n.e.c.	.258	-1.058	.615	-.237	.594
The Following as a Fraction of "net Acquisition of Financial Assets":					
Riskless Assets	.126	.648	-.620	.620	-.564
Risk Assets	.874	.315	1.853	.314	1.591
The Following as a Fraction of "net Increase in Liabilities":					
Demand Deposits and Currency	.415	.167	.413	.387	.642
Time Deposits	.564	.852	.507	.622	.326

*Risk assets: state and local obligations, corporation and foreign bonds, mortgages, consumer credit, security loans and bank loans n.e.c. Risk assets plus riskless assets do not add up to the "net acquisition of financial assets" because "other loans" are not included. Other loans consist of open market paper, C.C.C. guaranteed loans and C.C.C. certificates of interest which may be "riskless" or "risk" assets. Incidentally, some of the mortgages are government guaranteed and hence may properly be considered riskless in part.

Consumer credit also shows a strong cyclical pattern, although the proportion of consumer credit to the net acquisition of risk assets was much higher in the expansion of 1952:1 - 1953:3 than in the next two expansions.

State and local obligations and security loans as a percentage of risk assets show strong countercyclical trends.

During contractions time deposits make up a high proportion of the net increase in the liabilities of the banking and monetary system.

Even though there is evidence that during contractions the banking and monetary system swings to riskless assets instead of risk assets, the movement during the mild contractions does not fully offset the swing toward risk assets of the previous expansion. Hence a trend in the portfolio composition of the banking and monetary system is set up. Incidentally this trend is accentuated when the Federal Reserve System uses reductions in reserve requirements as its weapon to achieve secular increases in the money supply, for it is the commercial banking portion of the monetary and banking system that acquires risk assets.

5. Nonbank Financial Sector. The most striking aspect of the behavior of the nonbank financial sector is the rapid growth of savings and loan associations and credit unions as a proportion of the total nonbank financial sector. During the expansion of 1952:1 - 1953:3 they were 25 percent of the sector, during the expansion of 1958:3 - 1959:4 they were 36 percent of the sector. Noninsured pension funds also increased as a percentage of the total nonbank financial sector. Mutual savings banks, life insurance companies and other insurance companies tended to decline as a percentage of the total. It is this structural change within the nonbank financial sector that is the most striking feature of the period. It may be worth while conjecturing that the savings and loan associations and credit unions are the "new" financial institutions which have to be thoroughly assimilated into the financial picture.

There is some evidence that the acquisition by the nonbank financial sector of corporate and foreign bonds as a percentage of the total increase in financial assets is countercyclical, whereas that of one-to-four family mortgages is cyclical. However, of the major assets of these institutions (those which are more than 10 percent of the total portfolio) only consumer credit shows a pattern which definitely conforms to the cycle.

Even though there is no discernible cyclical pattern in deposits in mutual savings banks, savings shares, and saving through life insurance companies, the ratio of credit and equity market instruments to net increase in liabilities conforms to the cyclical

pattern: it is higher in expansions than in contractions. This pattern shows up in bank loans n.e.c. and open market paper, which are a higher proportion of total liabilities during the expansions than during the contractions. This may be evidence that these institutions overcommit themselves in terms of lending commitments during expansions, so they are forced to borrow to finance a part of their position. To the extent that this occurs, these institutions are in a relatively vulnerable position if a contraction goes so deep that they have to liquidate a part of their assets.

E. Changing Sources of Liquidity of Financial Institutions 1920's to Date

1. Introduction. Standard, traditional banking theory discusses two sources of liquidity for commercial banks. The traditional "commercial loan" source of liquidity centers around the dating of the asset. In addition a commercial bank is liquid to the extent that it can sell its assets on a market. In the recent past a third source of liquidity, the regular payments by the borrower on a fully amortized contract, has increased in importance.

In addition to these contractual and market sources of liquidity the explicit or implicit guarantee by either the central bank or another agency of the government that specific assets can be used as security for loans or can be sold in a market which will be orderly if not pegged is a source of liquidity.

In this section we will first examine the sources of liquidity for financial institutions, paying particular attention to the problems of commercial banks. The emphasis is upon commercial banks because their asset structure is much more complex than that of the other depository institutions (life insurance companies also have a complex asset structure) and because of the historic association of bank liquidity problems with financial crises. The essentials of the argument as to the sources of liquidity for commercial banks can be applied to the other depository institutions. After the general discussion of sources of liquidity we will look at the liquidity sources for member banks and savings intermediaries.

2. Sources of Liquidity. We will first discuss and compare sources of liquidity and how "central bank" guarantees affect liquidity. We will examine what the different types of assets mean for the liquidity of a commercial bank under the assumption that cash reserves plus earning assets equal total deposits, i.e., we will ignore the owner's investment.

A borrower on short term is obligated to provide the lender with money on or before the due date of the loan. If a banker keeps 10 percent in cash reserves and the rest of his assets in 90-day loans,

TABLE II-17

Financial Relations During Expansions and Contractions Contained in a Sustained Boom, 1952-1959
Nonbank Financial Sector

	Expansion 52:1-53:3	Contraction 53:4-54:3	Expansion 54:4-57:3	Contraction 57:4-58:2	Expansion 58:3-59:4
The following sub-sector acquisition of assets as a fraction of total for all sub-sectors:					
33. Mutual Savings Banks	.119	.109	.102	.119	.076
34. Savings & Loan Assoc. & Credit Unions	.252	.282	.299	.302	.363
35. Life Insurance Companies	.264	.287	.263	.226	.235
36. Other Insurance Companies	.101	.080	.046	.038	.067
37. Noninsured Pension Funds	.094	.103	.109	.119	.125
38. Finance, n.e.c.	.155	.138	.174	.176	.137
The following as a fraction of net acquisition of financial assets:					
39. Currency and Demand Deposits	-.004	.029	.019	.063	.003
40. Credit & Equity Instruments	.999	.937	.976	.880	1.006
41. Federal Obligations	.007	-.046	-.026	.025	.036
42. State and Local Obligations	.060	.098	.048	.052	.052
43. Corporate and Foreign Bonds	.281	.211	.172	.258	.174
44. Corporate stock	.076	.098	.085	.094	.113
45. 1-4 Family Mortgages	.342	.102	.439	.321	.422
46. Other Mortgages	.090	.086	.084	.082	.093
47. Consumer Credit	.122	.034	.108	.019	.076
48. Security Credit	.011	.034	.017	.025	-.006
49. Other Loans	.022	---	.053	.036	.036
50. Other Financial Assets	.022	.034	.009	.050	-.015
The following as a fraction of "net increase in liabilities":					
51. Deposits in M.S.B.	.134	.127	.102	.123	.068
52. Savings Shares	.263	.317	.300	.336	.339
53. Savings through Life Insurance	.224	.239	.188	.151	.173
54. Credit & Equity Market Instruments	.159	.092	.185	.114	.195
55. Corporate Bonds	.065	.021	.060	.027	.059
56. Corporate Stock	.034	.028	.062	.082	.081
57. Securities Credit	---	.077	-.004	.032	.016
58. Bank Loans, n.e.c.	.030	-.028	.044	-.068	.059
59. Open Market Paper	.030	---	.010	---	.016
60. F.H.L.B. Loans	---	-.007	.006	.082	.010
61. Miscellaneous	.009	.014	.017	.007	.020
62. Savings through Pension Funds	.798	.204	.200	.205	.218

then on the average of $1/65$ of the value of the loans will be due each business day. If the borrowers all fulfill their commitments, the average daily cash flow to the lender will be 1.54 percent of the total loan portfolio, or 1.38 percent of the deposits. The lender is in a position to withstand a run for n business days at the rate of $(10 + n \times 1.38)/n$ percent of deposits per business day. Experience

has indicated that such a cash position and flow is not sufficient to guarantee the liquidity of commercial banks.

If a bank has 10 percent of its total demand liabilities in cash and another 25 percent in marketable securities and if the market for the securities functions perfectly, the bank can withstand a drain of some 35 percent of its demand liabilities in one day. The liquidity of a combined portfolio can be expressed as follows: if cash is 10 percent, marketable assets 25 percent, and short-term loans 70 percent of deposits, then a drain at the rate of $10 + 25\lambda + n \times 1.0$ percent of deposits per business day be with-

stood (λ is the ratio of realized cash to book value for the marketable asset, if $\lambda < 1$ then obviously the institution must have a positive net worth (assets > deposits) to remain solvent). Experience has been that marketability is an adequate source of liquidity for a particular bank but not for the banking system, i.e., a bank with marketable assets and sufficient net worth can withstand a run, but the banking system that depends upon marketable assets is vulnerable to a financial crisis.

A commercial bank and other depository institutions, such as savings and loan associations, finance a position in earning assets by means of deposits. A run on a depository institution means that the financing for its position is being withdrawn. The depository institution has two alternatives—to "sell out" or refinance its position. Experience has shown that the repayment provisions on short contracts and the shiftability of assets in free markets are not sufficient to guarantee that financial institutions will not become illiquid. Central banking, by means of the discount window, offers guaranteed refinancing for certain classes of assets and, by means of open market operations, assures either orderly or pegged markets for other particular classes of assets. Assets which the central bank will either buy or accept as security for a loan can be considered as protected assets. A measure of the liquidity of a financial system is the relative importance of such protected assets.

Fully amortized contracts, which at present are the dominant form of mortgage and consumer credit contracts, can be interpreted as a series of dated loans, one loan coming due each month for the life of the contract. As is illustrated in Table II-40 page 363, a portfolio of fully amortized long-term mortgage contracts results

in a flow of cash to the mortgage holding institution which may run as high as 1 percent per month of the mortgage portfolio. For the shorter-term fully amortized consumer credit loans, the cash flow per month to the lending institution can be as high as 8 percent to 10 percent of the total of such loans outstanding. These flows are a major source of the liquidity for the savings intermediaries and consumer credit houses.

A mixed portfolio where 10 percent of deposits are in cash, 25 percent are in marketable assets, 50 percent are in short-term loans, 10 percent are in mortgages and 5 percent are in consumer credit can withstand a run at approximately the rate of $\frac{10 + 25\lambda + .8n}{n}$ percent per business day for n days.⁹

It is important to note that the consumer credit and mortgage payments generate a smaller cash flow per day than short-dated loans. Only a fraction of the liabilities of the consumer credit houses are in the form of short-term debts and they operate so as to keep unused lines of credit at commercial banks which are available to refinance their position if needed. On the other hand, the deposits in the specialized mortgage holding institutions are treated as "de facto" demand deposits. It is dangerous for institutions which depend upon amortized long-term contracts for their liquidity to have such "de facto" demand liabilities unless they have either a guaranteed refinancing source or a guaranteed market for their assets.

On the other hand, a large portion of the assets of commercial banks are in fact protected: hence it is not too great a decrease of their liquidity if they accept some fraction of amortized contracts.

3. Member Banks. In the 1920's the liquidity of the member banks of the Federal Reserve System, the most liquid in times of crisis of the commercial bank sector, was very limited. Of a total loans and investment portfolio of some \$36 billion in 1928 and 1929 only some \$11 billion at the outside were loans that could be rediscounted at the central bank, and only some \$4 billion were U.S. government securities which even in the 20's may be assumed to have a protected or guaranteed orderly market. The emphasis upon loans to carry securities as a source of liquidity in the 1920's is evident from Table II-17.

⁹The .8n is the sum of the cash flow due to

1. dated contracts = $50 \div 65$ (65 business days in 13 weeks)
2. mortgages = $\frac{1 \times 1}{10} \times \frac{1}{22}$ (22 business days in a month, 10 percent of deposits in mortgages)
3. consumer credit = $\frac{10 \times 1}{20} \times \frac{1}{22}$ (5 percent of deposits in consumer credit)

TABLE II-17

All Member Banks
Classification of Loans on Call Dates
Selected Dates--December 31
(Millions of dollars)

	1928	1929	1933	1939	1941	1945	1948	1959
Commercial Loans	*	*	*	5,386	8,064 ¹	8,949	37,144	36,826
Open Market Paper	602	582	604	455	607 ¹			
Agricultural Loans	*	*	*	730	972	855	3,052	3,116
Purchasing and Carrying Securities	9,903	10,118	4,611	1,490	1,192	6,511	4,329	4,472
Real Estate	3,122	3,191	2,359	2,957	3,494	2,455	20,013	22,185
Banks	538	714	287	56	39	47	710	811
Other	10,991*	11,515*	4,972*	2,888	3,653	7,957	20,239	29,281*
Total	25,155	26,150	12,833	13,962	18,021	22,775	84,061	94,779

*Other loans includes commercial and agricultural loans.

¹The Federal Reserve System began to report loans to other financial institutions in 1959. These are included in other loans here although such loans were apparently classified with commercial loans, including open market paper as well as other loans prior to 1959.

Source: Banking and Monetary Statistics, Federal Reserve System, Table 19, page 76, and The Federal Reserve Bulletin, June 1960, p. 652.

TABLE II-18

All Member Banks
Classification of Investment on Call Dates
December 31 of Selected Years
(Millions of dollars)

	1928	1929	1933	1939	1941	1945	1958	1959
U.S. Government Securities	4,312	3,863	7,254	14,328	19,539	78,338	54,299	46,813
States and Political Sub.	1,369	1,393	1,789	2,692	3,090	3,254	13,405	13,677
Other Securities	4,848	4,528	3,343	2,959	2,871	2,815	3,100	2,610
Total Investments	10,529	9,784	12,386	19,979	25,500	84,407	70,804	63,100
Total Loans	25,155	26,150	12,833	13,962	18,021	22,775	84,061	94,779
Total Loans and Investments	35,684	35,934	25,219	33,941	43,521	107,183	154,865	157,879

Source: Banking and Monetary Statistics, Federal Reserve System, Table 20, page 77, and the
The Federal Reserve Bulletin, June 1960, p. 652.

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In Table II-20 it is shown that not until the 1940's did the mortgage portfolio of the commercial banks provide for a predominant portion of amortized loans; from Table II-19 it is obvious that consumer installment credit loans did not provide any significant cash flows.

By the end of the 1920's, unless the central bank were willing to "throw away" all the rules of the central banking game as understood at that time, in times of crisis, the commercial banks were not in a very liquid position. By the rules of the game "as understood at that time" I mean the use of the discount window for restricted types of assets and perhaps open market purchase of government securities. It is obvious from looking at Table II-17 that in the 1928-29 period the central bank, to protect the liquidity of the commercial banking system, should have been considering the need to provide refinancing for the vast amount of paper related to "purchasing and carrying securities."

During the period of contraction and stagnation which followed 1929, the portfolios of the commercial banks changed very markedly. In 1941, with a total loans and investments of \$44 billion they owned some \$20 billion of U.S. government securities, some \$13 billion of commercial loans, open market paper agricultural loans and other loans. Loans for the purchasing and carrying of securities were reduced to \$1.2 billion; of the \$3.5 billion of real estate loans, \$1.5 billion were FHA insured, and some \$1.7 billion of consumer credit paper was owned by the banks.

All in all the extent of assets which could be sold in protected markets, refinanced through the central bank or which provided for regular cash flows increased as a proportion of commercial bank assets.

At the end of the Second World War, in 1945, over 70 percent of the total loans and investments were in U.S. government securities. At that stage the banks were very liquid due to their ownership of assets which could be sold if necessary in a protected market.

In the period of sustained boom since the end of the Second World War, the commercial banks have retreated from the position of extreme liquidity which they enjoyed in 1945. However, by the standards of the 1928-29 banking system, the member banks are still very liquid. Of total loans and investments of \$158 billion at the end of 1959, some \$47 billion were in U.S. government securities and some \$40 billion were in open market paper, agricultural loans and commercial loans. Loans for the purchase and carrying of securities amounted to only \$4.5 billion. Some \$13 billion of consumer installment loans were owned by the commercial banks as well as almost \$5 billion of FHA or VA mortgages. Hence the proportion of

the portfolio that was represented by fully amortized loans had increased markedly since the end of the 1920's.

Certainly marketability and amortization as sources of bank liquidity are much more important today than in the 1920's. In deriving this result we have ignored the rise of term loans to business which reinforces the conclusion.

TABLE II-19
Commercial Banks
Consumer Credit and Mortgage Loans
Selected Dates
(Millions of dollars)

	1929	1933	1941	1945	1958
Consumer Installment Loans	43	29	1,726	745	12,780
Real Estate Loans	3,191	2,359	3,494	2,455	20,013
FHA and VA Insured	--	--	1,465	1,506	8,811

Source: Federal Reserve Bulletins, various dates.

4. Savings Intermediaries. The most significant change in the liquidity of the nonbank financial intermediaries has been the shift from nonamortized or partially amortized mortgages to fully amortized mortgages. In Table II-20 the breakdown of conventional nonfarm mortgage loans by type of loan is exhibited. In Table II-21 the breakdown of mortgages by type of owner and type of guarantee, if any, is shown.

The shift to fully amortized mortgages between the 1920's and the postwar period has been very marked for life insurance companies and commercial banks. Unfortunately the data for savings and loan associations do not enable us to separate fully and partially amortized mortgages.

The marketability of a mortgage depends in part upon whether it is endorsed or guaranteed by an agency of the federal government. In Table II-21 the data on the breakdown of mortgages owned by financial intermediaries at the end of 1951 and at the end of 1958 is presented. During this period mutual savings banks increased the percentage of their mortgage portfolio consisting of guaranteed mortgages, but for the other institutions this percentage decreased. (What was happening in part was that the other institutions were

TABLE II-20

Distribution of Conventional Nonfarm Mortgage Loans Made by
Life Insurance Companies, Commercial Banks, and
Savings and Loan Associations by Type of
Loans within Indicated Period, 1920-1947

Type of Loan	1 to 4 Family Dwellings			All Other Property	
	Life Insurance Companies	Commercial Banks	Savings and Loan Associations	Life Insurance Companies	Commercial Banks
1920-1924†					
Fully amortized	27.5%	15.5%	94.4%	1.7%	5.8%
Partially amortized	56.2	42.4		77.6	40.7
Nonamortized	16.2	42.1	5.6	20.7	53.5
Total	100.0	100.0	100.0	100.0	100.0
1925-1929					
Fully amortized	18.9	16.2	†	6.3	10.7
Partially amortized	58.9	37.9	†	66.1	43.4
Nonamortized	22.2	45.9	†	27.6	45.9
Total	100.0	100.0	†	100.0	100.0
1930-1934					
Fully amortized	33.4	17.1	94.1	3.8	10.3
Partially amortized	50.4	38.1		69.8	39.7
Nonamortized	16.2	44.8	5.9	26.4	50.0
Total	100.0	100.0	100.0	100.0	100.0
1940-1947					
Fully amortized	90.6	48.8	99.8	53.1	51.9
Partially amortized	8.4	41.3		44.1	37.3
Nonamortized	1.0	9.8	0.2	2.8	10.8
Total	100.0	100.0	100.0	100.0	100.0

† Savings and loan association loans made during 1925-29 are included with those made in 1920-24.

Sources:

1. R.J. Saulnier, H.G. Halcrow, and N.H. Jacoby, Federal Lending and Loan Insurance, for the National Bureau of Economic Research (Princeton: Princeton University Press, 1958), Table 73, p. 358.
2. Based on National Bureau of Economic Research sample surveys of loans made after January 1, 1920 by 24 leading life insurance companies, 116 commercial banks, and 92 savings and loan associations.

TABLE II-21

Mortgages Owned by Financial Intermediaries*
By Type of Mortgage
(Billions of dollars)

	Insured		Conventional	Total	Percent Conventional of total
	F.H.A.	V.A.			
<u>End of 1951</u>					
Commercial Banks	3,421	2,921	4,929	11,270	44
Mutual Savings Banks	2,517	1,726	4,303	8,595	50
Life Insurance Companies	5,257	3,130	9,400	17,787	53
Savings & Loan Assns.	866	3,133	11,565	15,564	74
<u>End of 1958</u>					
Commercial Banks	5.48	3.34	9.78	18.59	53
Mutual Savings Banks	5.50	8.36	7.07	20.93	34
Life Insurance Companies	7.44	7.43	19.52	34.39	57
Savings & Loan Assns.	2.21	7.08	36.34	45.63	80

*Residential mortgages for commercial and mutual savings banks, nonfarm mortgages for life insurance companies and total mortgages outstanding for savings and loan associations.

"selling" some of their FHA and VA mortgages to eastern mutual savings banks.)

It is a rather serious trend for the liquidity of the savings and loan organizations, which have almost all of their assets in mortgages, to have a decreasing proportion of their assets in guaranteed, and therefore more readily marketable securities. The liquidity of these organizations in times of developing financial distress may depend upon their ability to realize enough on their guaranteed mortgages to withstand cash drains.

VI. THE VULNERABILITY OF THE FINANCIAL SYSTEM TO A SEVERE RECESSION

A. Introduction

Our theory emphasizes the effect upon aggregate demand of a financial crisis. It has been argued that the economy normally

"grows." This growth is interrupted quite regularly by mild contractions which are triggered by the constraining effect that a tight labor market has upon the actual achieved rate of increase of gross national product. Consumption, investment, and inventory behavior are assumed to set a limit to how fast income can decline, and these constraints normally operate to generate a lower turning point which is a large ratio of full employment income so that only a mild recession will occur. If a financial crisis or widespread generalized financial distress occurs, the stabilizing tendencies in consumption, inventory, and investment behavior will be offset. In this event a severe recession can take place.

It was also argued that each contraction does not generate a severe recession because the financial structure evolves during a period characterized by a sustained boom. Early in a sustained boom the financial structure is such that the effects upon financial relations of a contraction in income imposed by employment ceilings are damped out. As the financial system evolves due to the need to finance the sustained boom, the effects upon financial factors of a contraction in income similar in its original magnitude to those that occurred earlier will not be damped out. The financial repercussions will result in widespread and growing financial distress which may result in a financial crisis.

In this chapter we will take another tack. We will assume that a severe recession can occur independently of the behavior of the financial system. We will examine the effects upon some parts of the financial system of a number of hypothetical contractions of varying severity in gross national product.

We first examine what the reaction of the economy within a "borrowed" model would be to a large decline in expenditures that are assumed to be exogenous. We find that within the assumed structural relations the imposition of autonomous expenditure changes which are designed to approximate the 1929-32 changes in private autonomous expenditures generates a fall in income considerably smaller than was observed in 1929-32. Various quite arbitrary structural changes are then made in the original borrowed model, but even so we are not able to generate a fall in income that closely approximates the severity of the 1929-32 experience. In good part this is because in all our experiments we did not modify the per capita consumption function. Aside from dropping an assumption that population grows, the structural changes made in the model affect the relation between personal and disposable income.

We then estimate the amount of unemployment that would result from these assumed changes in income and examine some data on

spending by unemployed workers. The difference between the estimated spending by unemployed workers and their current disposable income gives us an estimate of the spending to be financed by drawing upon private financial resources. We examine the amount and distribution of deposits, redeemable assets, and guaranteed loans among various financial institutions. This yields us an estimate of the expected pressure upon the financial system that would accompany our various computational experiments.

In addition an independent estimate of the pressures that would be placed on savings and loan associations during some of these computational experiments is made. This is based upon a regression analysis of the deposits and withdrawals from savings and loan associations combined with estimates of the flow of funds to these institutions on account of the mortgages they own. It is then determined whether these institutions would have to sell assets at any stage of the contraction, and what rate of default by borrowers would have to take place to force either a massive sale of assets or a large scale refinancing of their position.

An examination is also undertaken of the flow of funds on social security and unemployment insurance accounts during such a period. It is shown that a large government cash deficit is generated which should result in an increase in the quantity of money. The variation in the flow of funds and the change in the money supply, given various social security laws, is estimated.

In this chapter we will not allow a financial panic to occur in order to force the financial institution into financial distress. That is, the value of equity and real estate assets will not be allowed to fall nor will runs on savings intermediaries be allowed to take place. However, once the effects of the income decline forces financial intermediaries to attempt to acquire cash by liquidating their portfolio, we can assert that the conditions are ready for a financial crisis. Hence neither foresight nor panic on the part of financial institutions, households, and firms is conjectured.

In addition, as was mentioned earlier, the empirical analysis is based upon existing relations. No attempt was made to adjust the data for the evolutionary forces at work in the financial system. Hence we are discussing the possibility of a severe drop in income generating a financial crisis within a financial system that is more heavily weighted with risk-free assets than in earlier periods, where equity and real estate type assets are not fully priced on the basis of extrapolated growth rates, where debt-equity ratios are still low, and where the ratio of pure money type assets to income is still quite high.

A final warning is in order. The study being reported here is to be interpreted as a pilot study rather than as a finished piece of work. It was done in a relatively short time and is being offered as an approach to the study of the relations between the "real" and the "financial" sectors of the economy which may have further applications.

B. The Generation of a Large Drop in Gross National Product

Our first problem is to generate a large drop in gross national product without having a financial crisis as a part of the initiating mechanism. If we use our basic accelerator-multiplier model and ignored any constraints upon its operation we could achieve this aim. However, if the values of α and β are such that a strong boom is generated, a boom that required constraining by a supply ceiling, then the downturn, unless constrained, is much too rapid to serve as a model for a contraction. Hence we will work with a model in which there are built-in stabilizers that act to constrain the contraction. However, we will erode the stabilizers in order to generate a drop in income that qualifies as a severe recession under an arbitrary standard to be adopted.

What do we mean by a severe recession? The contraction beginning in 1929 lasted for 43 months and the trough income was 55 percent of the peak income. A recession can be milder than this and still be serious. On the other hand we want the recession we generate to be more severe than those of the post-World War II period, for which, in the trough quarter, the gross national products were 97 percent, 98 percent, and 98 percent of their respective peak GNP's. Arbitrarily we will consider a recession severe if it results in at least a 10 percent drop in GNP during the first year of the contraction, a minimum of a 15 percent drop in GNP by the end of the second year, and if the lower turning point has not been passed at the end of the second year (using the peak income of the period as the first quarter of the first year).

One reason why the recessions to be examined must be stronger than the recessions of the postwar period is that during the entire post-World War II period to date the recessions have not been accompanied by any significant financial distress. The only financial shock of any severity that has taken place was the "2 5/8" episode of the summer of 1958 and this "shock" was an aspect of the recovery.

Any argument that the reason why no significant financial distress occurred was that the financial system is now too secure, or that the financial system at the time of the recession was too liquid, cannot be admitted in this discussion. For to admit these arguments would prejudice the case that a financial crisis can only occur within

an environment that has been prepared for crisis. Basically in this chapter we are examining whether or not a financial crisis can be generated solely by the changes in money flows due to a fall in income, ignoring the possibility that changes in asset values may be accompanying the change in income.

The financial "pressures" generated by the deep contraction are to generate a financial crisis. The financial pressures to be considered will be those placed upon the savings intermediaries by withdrawals, the reduction in new deposits and defaults that can be expected to accompany a deep recession. (The institution to be examined in detail is the Savings and Loan Associations.) We will examine if the flow of funds due to the amortized contracts these institutions own is sufficiently large to offset the net withdrawals. With this background we can estimate the maximum sustained drop in national income that can take place without forcing these organizations to sell their assets to acquire cash. It will be a problem of the next chapter to consider whether the market for their assets can be protected so that such forced sales will not necessarily result in a large fall in asset prices.

We are making some peculiar assumptions in this chapter. No matter what happens to gross national product and its various components, no decline in the market price of equity and real estate type assets will occur. If the prices of these assets are based upon an expectation that growth will take place, the fact that growth has not occurred will not affect their price. If the prices of the assets are based upon the expected incomes to be received, the fact that actual incomes are lower than expected incomes also has no effect. We have to make these assumptions, for we have identified a sharp drop in asset values as an attribute of a financial crisis, and we do not wish to have any significant financial distress take place unless it is the result of money flows directly related to the decline in income.

In what follows emphasis will be placed on unemployment and money flows from and to households that are affected by unemployment. A weakness in the argument is that losses and bankruptcies of business firms and the resulting defaults on business debt are not considered. This neglect of business firms is a corollary of the emphasis placed upon savings and loan associations in the numerical example, and would be corrected if greater attention is directed toward the effects of a recession on other financial intermediaries.

No runs upon financial institutions are allowed to occur. We will assume that withdrawals by households are the result of consumption behavior and disposable income; no accelerated withdrawals occur because of fear of a financial crisis.

We will borrow a model, one that is due to Duesenberry, Eckstein and Fromm¹ and subject this model to really severe changes in autonomous expenditures; changes derived from the 1929-33 experience. We will also have to modify the borrowed behavior equations in order to generate more severe recessions than we achieved by just imposing the strong shocks on the original model.

C. The Duesenberry-Eckstein-Fromm Model

Rather than design and estimate the parameters of a model to test the behavior of the economy as now structured when it is subject to strong shocks, we "borrowed" a model that was designed to explore the short-run reactions of the present day economy when it is subjected to "realistic" autonomous changes. This model, when subjected to the relatively mild shocks, exhibited strong stability and recovery properties. We subjected this model both to stronger shocks and structural changes of a destabilizing nature. Our aim was to achieve a decline in income that approximated the relative magnitude of the 1929-31 experience. In our attempt to do this we ran a number of computational experiments in which we changed both the structure of the system and subjected it to changes in autonomous expenditures more severe than in the Duesenberry, Eckstein and Fromm experiments.

In spite of the strength of our shocks and the structural changes we experimented with, we never achieved an over-all relative decline of income of the order of magnitude of the 1929-31 experience.

The Duesenberry-Eckstein-Fromm model has three parts:

- 1) A set of exogenously determined expenditures.
- 2) A set of behavioral and definitional relations which transform GNP into disposable personal income, which is the "key" variable in the consumption function.
- 3) A consumption function.

The Duesenberry-Eckstein-Fromm Model is set out in Chart II-3. (We will henceforth refer to this model and their experiments as the D.E.F. model or experiments. The experiments undertaken for this paper will be called Minsky-Bonem (M-B) experiments.)

¹James S. Duesenberry, Otto Eckstein, and Gary Fromm, Stability and Instability in the American Economy (Harvard University, 1958). Paper prepared for conference on economic stability of the Social Science Research Council. Also, J.S. Duesenberry, Otto Eckstein, and G. Fromm "The U.S. Economy in Recessions," Econometrics, Vol. 28, No. 4 (October 1960).

$$(1) \text{ GNP} = C + I + G + F$$

(2) GNP

$$-1. \text{ Capital Consumption} = 37.287 + .6571(t-1957:3)$$

$$-2. \text{ Indirect Business Tax} = 26.573 + .0238 \text{ GNP}_t + .16(t-1957:3)$$

$$-3. \text{ Statistical Discrepancy} = .5$$

$$-4. \text{ Corporate Income Tax} = .51 P_{at}$$

$$-5. \text{ Retained Corporate Earnings} = .530 - .91 D_{vt-1} + .411 P_{at}$$

where P_{at} (Corp. profits after inventory valuation adjustment) is $.253 - .23(S_{ft} - S_{ft-1}) - .558 (\Delta \text{Inv}_t - \Delta \text{Inv}_{t-1}) +$

$$P_{ago} - CC_t$$

where S_{ft} = final sales

P_{ago} = corporate profits + capital consumption at the peak GNP level.

$$-6. \text{ Contributions to Social Insurance} = .0330 \text{ GNP}_t$$

+7. Government transfers:

$$7.1 \text{ a) Relief payments} = 1.703 + .0093(\text{GNP}_0 - \text{GNP}_t) + .0335(t-1946:3)$$

$$7.2 \text{ b) Unemp. benefits} = 2.287 + .1075(\text{GNP}_0 - \text{GNP}_t)$$

$$7.3 \text{ c) OASI and other} = 14.40 + .425(t-1957:2)$$

$$7.4 \text{ d) Interest} = 6.2$$

$$\text{Total transfers} = 26.231 + .4585(t-1957:2) + .1168(\text{GNP}_0 - \text{GNP}_t)$$

= Personal Income

$$8. \text{ Personal Tax and Nontax payments} = .04748 Y_p + .03828 (Y_p)^2 / \text{pop.1000} + .165 (t-1957:2) + .540$$

= Disposable Personal Income

$$(3) (\text{per capita}) C/Y_{dt-1} = .535 - .137 \frac{Y_{dt-1}}{Y_{dt-2}} + .57 \frac{C_{t-1}}{Y_{dt-2}}$$

(1) I, G, F autonomous

(In Duesenberry, et. al., change in inventory was estimated from an equation; it is treated here as autonomous.) (For method of obtaining I, G, F, see below.)

GNP_t = Gross National Product at time t

GNP_0 = Peak GNP

t = time, measured in quarters of a year

D_{vt} = corporate dividends at time t

P_{at} = corporate profits after inventory valuation adjustment

S_{ft} = final sales = GNP - change in inventory

S_{ft} = peak final sales

ΔInv = change in inventory

P_{ago} = peak (corp. profits + capital consumption)

CC = capital consumption

Y_p = Personal income

Y_d = Disposable personal income

C = consumption

G = government expenditure

F = net foreign investment

D.E.F. considered investment, government expenditure and the net foreign investment as autonomous, and they derived a series of inventory changes from the behavior of the economy.² Calling the sum of these "autonomous expenditures," gross national product equals consumption plus autonomous expenditures. In Table II-22, the three series of autonomous expenditures used by D.E.F. and the single set derived by M-B are given. The first case D.E.F. labeled as a realistic case: It provided for an approximately 10 percent decline in the annual rate of autonomous expenditures between 1957:3 and 1958:2 followed by a rise in these expenditures; by 1959:2 autonomous expenditures were 7.4 percent above 1957:3.³ The second case, labeled the disaster case, provided for a fall of 11.6 percent in autonomous expenditures between 1957:3 and 1958:2 followed by a further decline to 16 percent below 1957:3 by 1959:1, after which an increase in investment took place. The third case, labeled the multiplier case, assumed a decline in the autonomous expenditures of 7.9 percent (from 156.4 to 144.0) in one quarter (between 1957:3 and 1957:4) after which autonomous expenditures were stabilized.

In contrast to these series, the estimated decline in autonomous expenditures used in the M-B experiments was 10.9 percent during the first year followed by a further sharp drop, so that in 1959:2 autonomous expenditures stood at 74.6 percent of their 1957:3 value.

The transformation from GNP to disposable personal income is given by the eight equations "included" as part of equation 2 of the D.E.F. model. In the later experiments we will modify the following:

Equation 1 dealing with capital consumption.

Equation 5 dealing with corporate retained earnings.

Equation 7 dealing with government transfers as well as dropping the D.E.F. assumption that population grows.

²In the D.E.F. model, inventory investment is a variable determined within the system, not an autonomous demand. Inventory investment was treated in the M-B computational experiments as autonomous, changing at 1929-32 rates.

³All of the computational experiments assume that 1957:3 was a peak quarter and a quarterly series of GNP and its components are derived dating from 1957:3. Thus 1959:2 is the eighth quarter of the time series we compute.

TABLE II-22

Autonomous Demand in D.E.F. and M.B. "Experiments"

	D.E.F.			M.B.		
	1	2	3	Total [†]	Pvt. Invest.	Gov't.
1957:3	156.4	156.4	156.4	157.3	66.7	87.0
4	151.4	151.4	144.0	151.0	60.5	--
1958:1	145.4	145.4	144.0	145.3	54.9	--
2	140.1	138.2	144.0	140.2	49.9	--
3	143.2	136.4	144.0	130.6	41.2	--
4	149.4	131.9	144.0	125.6	36.4	--
1959:1	158.5	131.4	144.0	121.2	32.2	--
2	167.9	132.4	144.0	117.4	28.5	--
3				107.3	19.4	--
4				103.2	15.3	--
1960:1				99.9	12.1	--

[†]This is the autonomous demand for experiments 1-7; for experiment 8, D.E.F.-1 autonomous demand is used and for experiment 9, D.E.F.-2 autonomous demand.

The above with initial level = 100

	1	2	3	Total	Pvt. Invest.	Gov't.
1957:3	100.0	100.0	100.0	100.0	100.0	100.0
4	96.8	96.8	92.1	96.0	90.7	--
1958:1	93.0	93.0	--	92.4	82.3	--
2	89.6	88.4	--	89.1	74.8	--
3	91.6	87.2	--	83.0	61.8	--
4	95.5	84.3	--	79.8	54.6	--
1959:1	101.3	84.0	--	77.0	48.3	--
2	107.4	84.7	--	74.6	42.7	--
3			--	68.2	29.1	--
4			--	65.6	22.9	--
1960:1			--	63.5	18.1	--

The consumption function as given in equation 3 can be transformed into

$$C_t = .535 Y_{d,t-1} - .137 \frac{Y_{d,t-1}}{Y_{d,0}} Y_{d,t-1} + .57 C_{t-1} \frac{Y_d}{Y_{d,t-2}},$$

where all variables are in per capita terms. This is of the general form $C_t = \alpha_0 + \alpha_1 Y_{t-1}$ with two modifications. The component

$-.137 \frac{Y_{d,t-1}}{Y_{d,0}} Y_{d,t-1}$ serves to "change" the propensity to consume

when present income is peak income from what it is when present income is not peak income. When $Y_{d,t-1} = Y_{d,0}$ then we have

$$C_t = .398 Y_{d,t-1} + .57 C_{t-1} \frac{Y_d}{Y_{d,t-2}}$$

The component $+.57 C_{t-1} \frac{Y_d}{Y_{d,t-2}}$ basically is a stabilizing factor

asserting that a large proportion of any period's consumption depends upon habits which do not change too rapidly, and is equivalent to the α_0 in the general formulation. Also note that if

$$C_{t-1} / \frac{Y_d}{Y_{d,t-2}} = \frac{C_t}{Y_{d,t-1}} \text{ during a period in which } Y_{d,t-1} = Y_{d,0}, \text{ then}$$

$$C_t / Y_{t-1} = \frac{C_{t-1}}{Y_{t-2}} = .7.$$

Because of the inclusion of previous period's consumption and the peak income components, the consumption relation tends to retard the decline in income that would take place. In none of our experiments do we modify the per capita consumption function, for if we did this in the direction of lowering consumption we would be implicitly assuming that a "financial shock" had occurred.

In what D.E.F. label as their realistic case, their experiment 1, gross national product falls from \$440.0 billion in 1957:3 to \$419.7 billion in 1958:2, a decline of some 4.6 percent. In this experiment 1958:2 is the trough. That is a shock whose maximum intensity of 11.4 percent results in a 4.6 percent decline in income. (This case can be fairly labeled as realistic, for the actual 1957:3 - 1958:2 contraction was approximately 3.7 percent of peak GNP.)

We know that a decline of this magnitude had no measurable effect upon the financial system, hence we have to look for a more severe fall in income.

In what D.E.F. call their disaster model, GNP fell from \$440 billion in 1957:3 to \$406 billion in 1959:1, which is the trough. This trough is 7.8 percent below the peak income, and the "disaster" shock which initiated this recession was a decline of 16 percent in autonomous expenditures. Once again the strong ability of the system to cushion autonomous shocks is evident.

The pure multiplier yields a drop of less than 5 percent in two quarters followed by a slow rise in income. This experiment we will ignore in the balance of this study.

Even the D.E.F. disaster model does not lead to a very serious drop in gross national product, and such a drop in gross national product would not be associated with any real pressure on our financial system as now constituted.

D. Various Experiments Designed to Generate Severe Recession

Our problem is to generate truly severe recessions by computational experiments and then examine what pressures these recessions impose upon the financial system. We can achieve these more severe recessions by:

- 1) imposing more severe shocks to the D.E.F. model;
- 2) changing the structural attributes of the model;
- 3) combining more severe shocks with structural changes.

In this section we will report on some nine computational experiments in which all three ways of achieving such severe recessions were tried. Only by combining severe shocks with structural changes were we able to generate what we define as severe recessions.

Of course these nine experiments do not exhaust the possible manipulations of the basic D.E.F. model. The selection of the experiments followed two principles. These were to subject the economy to a really large change in autonomous expenditures and to modify the structural relations only to the extent necessary to achieve a severe recession, leaving the per capita consumption function unchanged.

What do we mean by a severe recession? The contraction of 1929-33 certainly qualifies. In Table II-23, a quarterly series

TABLE II-23

Interpolated Private Investment, Government Expenditures
and Net Foreign Investment, 1929-32, Annual Rates

	GNP	Pvt. ↑ Invest.	Gov't. Expend.	Net Foreign Investment	Inventory Invest.	Consump- tion
1929:3	102.6	15.2	8.6	.8	1.3	77.9
4	99.3	13.8	8.7	.7	1.0	75.9
1930:1	96.1	12.6	8.9	.7	.7	74.0
2	93.1	11.4	9.1	.7	.5	72.1
3	89.0	9.4	9.2	.5	--	69.6
4	85.4	8.4	9.2	.5	- .1	67.3
1931:1	81.9	7.4	9.2	.4	- .5	65.0
2	78.5	6.5	9.2	.4	- 2.8	62.8
3	73.6	4.4	9.1	.2	- 1.7	59.6
4	69.3	3.5	8.8	.2	- 1.9	56.6
1932:1	65.2	2.8	8.5	.2	- 2.2	53.9
2	61.4	2.2	8.2	.2	- 2.6	51.2

*Includes inventory investment

The above with 1929-33 = 100						
	GNP	Pvt. Invest.	Gov't. Expend.	Net Foreign Investment	Inventory Invest.	Consump- tion
1929:3	100.0	100.0	100.0	100.0	100.0	100.0
4	96.8	90.8	101.1	87.5	76.9	97.4
1930:1	93.7	82.9	103.4	87.5	53.8	95.0
2	90.7	75.0	105.7	87.5	38.5	92.6
3	86.7	61.8	106.9	62.5	--	89.3
4	83.2	55.3	106.9	62.5	- 7.7	86.4
1931:1	79.8	48.7	106.9	50.0	- 38.5	83.4
2	76.5	42.8	106.9	50.0	-215.4	80.6
3	71.7	28.9	105.7	25.0	-130.8	76.5
4	67.5	23.0	102.3	25.0	-146.1	72.7
1932:1	63.5	18.4	98.8	25.0	-169.2	69.2
2	59.8	14.5	95.3	25.0	-200.0	65.7

derived by interpolating from the annual 1929-32 series is presented.⁴ We arbitrarily assume that if a severe recession proceeds for two years and no lower turning point is reached, "something" will be done—in the sense that government expenditures or taxes, etc., designed to affect income, will be changed. As we do not wish to undertake an examination of the effectiveness of fiscal policy, we will limit our analysis to eight quarters using the peak quarter as the first quarter although many of the computations are carried out to the eleventh quarter past the assumed peak.

The peak quarter in 1929 was 1929:3 at which time gross national product was \$102.6 billion. At the end of the second year 1931:2 GNP was \$78.5 billion. Measuring from 1929:3 as 100, GNP in 1931:2 was 76.5, a fall of 23.5 percent from the peak. We will first attempt to generate a contraction as severe as the 1929-31 contraction by imposing upon the D.E.F. structure the series of autonomous expenditure derived from the 1929-31 experience. The estimates of the quarterly series of the components of autonomous expenditures in this period are given in Table II-23. The unexpected item in this series is that government expenditures rose during the first year of the contraction and only began to fall in the third year. The great difference between 1929-31 and the present day economy is that government expenditures were but 8 percent of GNP and 35 percent of autonomous expenditures in 1929:3, and they were almost 20 percent of GNP and 55 percent of autonomous expenditures in 1957:3. In deriving our severe shocks we assumed that private investment behaved as private investment had behaved in

⁴The method used was to take the annual totals of investment, etc. for 1929-32 and determine the quarterly rate of change. When these rates were applied to data for, e.g., the third quarter, 1957, a series was found which moved similar to that of 1929-32. If I_t is investment, then $-\frac{I_{t+1} - I_t}{I_t} / 4$ gives the quarterly rate of change from the third quarter of year "t" to second quarter, year "t+1."

To apply the quarterly rates of change to 1957, two things are necessary: 1) multiplying the actual investment of 1957:3 by $(1-R)$, $(1-R)^2$, etc., where R is the quarterly rate of change, 1929-30, gives totals for 1957:4, 1958:1, 1958:2; 2) to find investment for 1958:3, the rate just used became irrelevant nor can the rate for the next four quarters be used: by using a "link rate," $R^1 = \frac{I_{1930:3} - I_{1930:2}}{I_{1930:2}}$, the total for 1958:3 ($= (1-R^1) I_{1958:2}$). Having made this transition, the 1930-31 quarterly rate of decrease is used until 1959:3; at this time, a new "link rate" is again computed and applied to investment of 1959:2. Similar procedure yields estimates of quarterly GNP, consumption, and so on.

1929:3 - 1931:2 and that government investment remained constant at \$87 billion. Whereas the autonomous expenditures in 1930:2 were 66 percent of the autonomous expenditures in 1929:3 in our severe shock series, based upon the 1929-32 experience for private investment but with the weight to government and private autonomous expenditures derived from present day relations, the equivalent eighth quarter autonomous expenditure is 74.6 percent of the peak quarter's autonomous expenditure. Hence our inability to generate a recession as severe as 1929-31 is in part due to the fact that our shock series was smaller.⁵

We quite arbitrarily will take as a really severe recession one that achieves a decline equal to 80 percent of the decline from 1929:3 to 1931:2, i.e., a decline of 18 percent. Once we modified the structural relations sufficiently to achieve this we halted our search for structural changes.

In Chart II-4, the definitions of the various Minsky-Bonem experiments are given. In Tables II-24 and II-25, the results of the computational experiments carried out for this study as well as the three relevant computational experiments of the D.E.F. study are presented.

In the first M-B computational experiment, the more severe shocks were applied to the unadjusted D.E.F. structure. GNP in the eighth quarter was 12.3 percent below the ceiling GNP.

The first structural adjustment was to change the dividend equation, for, with the relatively severe recession of M-B, dividends in excess of corporate profits were being paid and it was assumed that this would not take place in a severe recession. This adjustment, carried out in M-B experiment 2, did lower computed income in all quarters after the first when compared with the unmodified D.E.F. structure, and in the eighth quarter GNP was 86 percent of the ceiling.

⁵In the eighth quarter of the 1929 contraction GNP was 76.5 percent and autonomous expenditures were 66 percent of their values in the peak quarter. In the tenth quarter of the seventh computational experiment GNP was 76.8 percent and autonomous expenditures were 65.6 percent of their values in the peak quarter.

Perhaps by the time we had changed the structure of the model for the seventh experiment, the difference between the contraction in the seventh computational experiment and in 1929 was mostly due to the relative moderateness of our autonomous expenditures series. If this is true, there are some obvious policy implications.

CHART II-4

The Various Minsky-Bonem Computational Experiments

Experiment	Autonomous Expenditures	Structure
1.	M.B.	D.E.F.
2.	M.B.	D.E.F. with $D_{vt} = .6(CP_t - CP_{taxes})$ or R.E. = .196 CP_t in place of D.E.F. equation 2:5.
3.	M.B.	D.E.F. with population constant at 1957:2 level rather than D.E.F.'s assumed population trend.
4.	M.B.	D.E.F. with $Depc = .64 + .9989 \left[\sum_{36} \frac{Ip(t-\lambda)}{36} + \sum_{10} \frac{Ie(t-\lambda)}{10} \right]$ $\lambda = -.35 \quad \lambda = -.9$ in place of D.E.F. equation 2:1.
5.	M.B.	D.E.F. with changes of experiments 2, 3, and 4.
6.	M.B.	D.E.F. with equations 2:6 and 2:7 divided by two.
7.	M.B.	D.E.F. with changes of experiments 2, 3, 4, and 6.
8.	D.E.F. 1 ("realistic" case)	M.B. 6.
9.	D.E.F. 2 ("disaster" case)	M.B. 6.

* I_p = investment in plant
 I_e = investment in equipment

TABLE II-24

Computed Gross National Product Series, Various "Experiments"

	D.E.F.			M.B.								
	1	2	3	1	2	3	4	5	6	7	8	9
1957:3	440.0	440.0	440.0	445.6	445.6	445.6	445.6	445.6	445.6	445.6	440.0	440.0
4	431.6	431.6	424.2	440.5	440.5	439.6	440.5	439.6	440.5	439.6	435.6	435.6
1958:1	425.8	425.8	422.4	436.1	429.4	428.5	430.1	427.3	426.8	423.0	423.4	423.4
2	419.7	417.8	422.4	424.6	419.3	419.5	421.8	416.6	416.0	409.7	415.2	413.3
3	420.8	413.6	422.9	410.4	407.1	407.0	410.3	402.4	403.7	394.2	416.3	409.0
4	428.0	407.9	423.2	401.4	396.6	397.8	400.8	391.6	393.7	381.9	427.7	402.9
1959:1	439.8	406.0	423.2	394.8	389.2	390.8	394.5	383.5	386.5	372.7	435.7	401.2
2	453.1	406.6	423.2	390.8	383.3	385.2	389.8	377.0	380.8	364.9	451.2	402.5
3				380.8	370.8	374.1	379.7	365.3	369.7	352.2		
4				373.4	362.1	365.6	372.1	356.5	360.4	342.2		
1960:1				367.9	355.3	359.1	366.7	350.2	353.5	334.5		

TABLE II-25

National Income "Experiments" with Initial Condition, GNP = 100

	D.E.F.			M.B.								
	1	2	3	1	2	3	4	5	6	7	8	9
1957:3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
4	98.1	98.1	96.4	98.8	98.8	98.6	98.6	98.6	98.8	98.6	99.0	99.0
1958:1	96.7	96.7	96.0	97.9	96.4	96.2	96.5	95.9	95.8	94.9	96.2	96.2
2	95.4	94.9	96.0	95.3	94.1	94.1	94.7	93.5	93.4	91.9	94.3	93.9
3	95.6	94.0	96.1	97.1	91.4	91.3	92.1	90.3	90.6	88.5	94.6	92.9
4	97.2	92.7	96.2	90.1	89.0	89.3	89.9	87.9	88.3	85.7	96.0	91.5
1959:1	99.9	92.2	96.2	88.6	87.3	87.7	88.5	86.1	86.7	83.6	99.0	91.2
2	102.9	92.4	96.2	87.7	86.0	86.4	87.5	84.6	85.5	81.9	102.5	91.4
3				85.5	83.2	83.9	85.2	82.0	83.0	79.0		
4				83.8	81.3	82.0	83.5	80.0	80.9	76.8		
1960:1				82.6	79.7	80.6	82.3	78.6	79.3	75.1		

Note: Estimated % decrease:

a) 1929:3 - 1932:1 = 36.0

b) 1929:3 - 1931:2 = 23.4

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In experiment 3, the assumption made in D.E.F. that population growth was taking place was dropped. The resulting series did not differ by very much from the series of experiment 1.

In experiment 4, the capital consumption equation was modified. This had almost the same final effect upon GNP as the structural change of experiment 2, but it did result in a more rapid rate of decline during the first quarters than took place in experiment 2.

In experiment 5, the structural changes of experiments 2, 3, and 4 were all included. In the eighth quarter GNP was 84.6 percent of the peak GNP so that by these structural changes we succeeded in lowering GNP by 3.1 percent more than in M-B experiment 1.

In experiment 6, we halved the taxes collected on account of social insurance and the government transfer payments, which include interest payments as well as benefits from the various social insurance and relief schemes. In this experiment the eighth period's GNP was 85.5 percent of the initial GNP.

In experiment 7, all of the structural changes of the earlier experiments were combined: the behavior of dividends, capital consumption, population, and social security were all changed. As a result the eighth period's GNP was 81.9 percent of the peak GNP.

In experiments 8 and 9, the more modest D.E.F. autonomous expenditures series was applied to the structure of experiment 6. This resulted in a somewhat, but not significantly, lower GNP series than the original D.E.F. experiment using these shocks.

The major difference between the various time series generated by the different experiments is in the slight difference in consumption behavior. Without breaking the effect of previous peak income and past consumption on present consumption, the ratio of consumption to GNP rises from its initial value of .65 in the various M-B experiments and this acts to stabilize income.

We will now examine the effects of some of the "experimental" declines in income on the financial system.

E. Spending by Unemployed Workers

In order to estimate the financial pressures that result from declining incomes we will estimate the withdrawals from the various financial intermediaries due to spending in excess of disposable income by households with unemployment. We will do this in three steps:

TABLE II-26

Consumption Expenditures in Various Experiments

	D.E.F.		M.B.		
	1	2	1	5	7
1957:3	283.6	283.6	288.3	288.3	288.3
4	280.2	280.2	289.5	288.6	288.6
1958:1	280.3	280.3	285.1	282.0	277.7
2	279.6	279.6	284.4	276.4	269.5
3	277.6	277.2	279.8	271.8	263.6
4	278.7	276.0	275.8	266.0	256.3
1959:1	281.3	274.6	273.6	262.3	251.5
2	285.2	274.2	273.4	259.6	247.5
3			273.5	258.0	244.9
4			270.2	253.3	239.0
1960:1			268.0	250.3	234.6

The above, with starting point = 100

	D.E.F.		M.B.		
	1	2	1	5	7
1957:3	100.0	100.0	100.0	100.0	100.0
4	98.8	98.8	100.4	100.1	100.1
1958:1	98.8	98.8	98.9	97.8	96.3
2	98.6	98.6	98.6	95.9	93.5
3	97.9	97.7	97.1	94.3	91.4
4	98.3	97.3	95.7	92.3	88.9
1959:1	99.2	96.8	94.9	91.0	87.2
2	100.6	96.7	94.8	90.0	85.8
3			94.9	89.5	84.9
4			93.7	87.9	82.9
1960:1			93.0	86.8	81.4

TABLE II-27

Consumption and Gross National Product
Eighth Quarter as Percent of Peak and Ratio
D.E.F. Experiments 1 and 2, M.B. Experiments 1, 5, and 7

Experiment	G.N.P.	Cons.	C/GNP
D.E.F.-1	102.9	100.6	.63
D.E.F.-2	92.4	96.7	.67
M.B.-1	87.7	94.8	.70
M.B.-5	84.6	90.0	.69
M.B.-7	81.9	85.8	.68

(1) estimate the relations between changes in the percent of unemployed and changes in GNP.

(2) estimate how much the households with unemployment spend in excess of their income.

(3) combine these to get an estimate of spending in excess of disposable income due to the unemployment expected with our computational experiments.

The relation that was obtained between seasonally adjusted unemployment rates and gross national product, seasonally adjusted at the annual rate using quarterly data for the period 1947-59 is:

Equation E.1:

$$\zeta = .3603 - .0663 (\Delta \text{GNP})$$

ζ = change in unemployment rate.

This implies that an increase of \$5.4 billion per quarter in GNP is necessary to keep the unemployment rate a constant.

Starting with an initial unemployment rate of 4.4 percent in 1957:3, the effects of changes in GNP upon the unemployment rate for the following computational experiments were calculated: D.E.F.-1, M.B.-1, M.B.-5 and M.B.-7. These computations are presented in Table II-28.

TABLE II-28

Unemployment and Spending in Excess of Disposable Income

	GNP	ΔGNP	ΔUR	UR	Labor Force	Unemployed	Monthly Total Excess Spending †
<u>M.B.-1</u>							
1957:3	445.6			4.4	68.994	3.036	288.420
4	440.5	- 5.1	.70	5.1		3.519	334.305
1958:1	436.1	- 4.4	.65	5.7		3.933	373.635
2	424.6	-11.5	1.12	6.8		4.692	445.740
3	410.4	-14.2	1.30	8.1		5.589	530.955
4	401.4	- 9.0	.96	9.1		6.278	596.410
1959:1	394.8	- 6.6	.80	9.9		6.830	648.850
2	390.8	- 4.0	.63	10.5		7.244	688.180
3	380.8	-10.0	1.02	11.5		7.934	753.730
4	373.4	- 7.4	.85	12.4		8.555	812.725
1960:1	367.9	- 5.5	.72	13.1		9.038	858.610
<u>M.B.-5</u>							
1957:3	445.6			4.4	68.994	3.036	288.420
4	439.6	- 6.0	.76	5.2		3.588	340.860
1958:1	427.3	-12.3	1.16	6.4		4.416	415.520
2	416.6	-11.7	1.12	7.5		5.244	498.180
3	402.4	-14.2	1.30	8.8		6.071	576.745
4	391.6	-10.8	1.08	9.9		6.830	643.850
1959:1	383.5	- 8.1	.90	10.8		7.451	707.845
2	377.0	- 6.5	.79	11.6		8.003	760.285
3	365.3	-11.7	1.14	12.7		8.762	832.390
4	356.5	- 8.8	.94	13.6		9.383	891.385
1960:1	350.2	- 6.3	.78	14.4		9.935	943.825

†On basis of average excess spending of \$95.00 per month for households with unemployment.

TABLE II-28 (Continued)

	GNP	ΔGNP	ΔUR	UR	Labor Force	Unemployed	Monthly Total Excess Spend
<u>M.B.-7</u>							
1957:3	445.6			4.4	68.994	3.036	364.320
4	439.6	- 6.0	.75	5.1		3.519	422.280
1958:1	423.0	-16.6	1.46	6.6		4.554	546.480
2	409.7	-13.3	1.24	7.8		5.382	645.840
3	394.2	-15.5	1.39	9.2		6.347	761.640
4	381.9	-12.3	1.18	10.4		7.175	861.000
1959:1	372.7	- 9.2	.97	11.4		7.865	943.800
2	364.9	- 7.8	.88	12.3		8.486	1,018.320
3	352.2	-12.7	1.20	13.5		9.314	1,117.680
4	342.2	-10.0	1.02	14.5		10.004	1,200.480
1960:1	334.5	- 7.7	.87	15.4		10.625	1,275.000
<u>D.E.F.-1</u>							
1957:3	440.0			4.4	68.994	3.036	288.420
4	431.6	- 8.4	.92	5.3		3.657	347.415
1958:1	425.8	- 5.8	.74	6.0		4.140	393.300
2	419.7	- 6.1	.76	6.8		4.692	445.740
3	420.8	1.1	.29	7.1		4.899	465.405
4	428.0	7.2	-.12	7.0		4.830	458.850
1959:1	439.8	11.8	-.42	6.6		4.554	432.630
2	453.1	13.3	-.52	6.1		4.209	399.855
3							
4							
1960:1							

†On basis of average monthly excess spending of \$95.00 per month for households with unemployment.

TABLE II-28 (Concluded)

Adjustment in Monthly Average Excess of Outlay over Income for Unemployed Workers for Change in Social Security Payments		
	M.B.-7 Unemployed*	Monthly Total Excess ⁺
1957:3	3.036	364.320
4	3.519	422.280
1958:1	4.554	546.480
2	5.382	645.840
3	6.347	761.640
4	7.175	861.000
1959:1	7.865	943.800
2	8.486	1,018.320
3	9.314	1,117.680
4	10.004	1,260.480
1960:1	10.625	1,275.000

*From previous table.

⁺ On basis of average excess spending of \$120.00 per month for households with unemployment.

Under the D.E.F. Experiment 1 the maximum unemployment rate was 7.1 percent of the labor force. At the eighth quarter after the peak the unemployment rate in M.B.-1 is 10.5 percent; in M.B.-5, 11.6 percent; and in M.B.-7, 12.3 percent. Assuming that the labor force remains constant at 68.994 million under experiment M.B.-7, some 8.486 million will be unemployed eight quarters after the peak, an increase of 5.45 million from the unemployment at the cyclical peak.

The equation for the relation between changes in GNP and changes in the unemployment rate was estimated on the basis of 1947-59 data. During this period no serious recession occurred. As a result, firms whose sales and output declined did not lower their labor force by the same ratio; the sales, clerical and administrative staffs were not reduced. On the other hand if a protracted recession occurs we can expect some cutbacks in the number of such overhead employees.

If we take 18.1 percent as the decline in GNP at the end of two years as our severe recession, this decline would be accompanied, according to our estimate, by a 7.9 percent rise in unemployment. Of course the spreading of work by the use of short-time employment for a large number of workers could be the "pattern" during such a severe recession, but quite arbitrarily we will assume for one experiment that unemployment rises by 5.1 percent (18.1 - 7.9/2) more than the 7.9 percent—i.e., by 13 percent. Hence we would have 17.4 percent of the labor force unemployed; this gives us approximately 12 million unemployed. We will estimate the financial effects of 12 million unemployed during the eighth quarter of our recession in addition to estimating the financial effects of selected M.B. contractions.

Expenditures for the unemployed were collected for some sample studies of benefits under unemployment compensation. The relevant data are summarized in Tables II-29 and II-30. Using a 1-2-1 weighting scheme for the various types of households, a very rough estimate was derived that the average expenditure in excess of income is \$95 per month per household unit with unemployment.

Under the assumption that the unemployment benefit is halved and that the reduction in consumption is one-half the difference between the old and the new unemployment benefit, an estimate of \$120 per month of the excess payments over the income is derived for the households with unemployment.⁶

$6Y_1$ = New income of unemployed
 Y_0 = Previous income of unemployed
 C_1 = New consumption of unemployed
 C_0 = Previous consumption of unemployed
 UB_1 = New benefits of unemployed
 UB_0 = Old benefits of unemployed

$$\text{Assume: } UB_1 = \frac{1}{2} UB_0$$

$$\Delta C = -\frac{1}{2} (UB_1 - UB_0)$$

$$\text{Then, } Y_1 = \frac{1}{2} UB_0 + (Y_0 - UB_0)$$

$$C_1 = C_0 - \frac{1}{2} (UB_1 - UB_0) = C_0 - \frac{1}{4} UB_0$$

$$(C_1 - Y_1) = (C_0 - Y_0) + \frac{1}{4} UB_0$$

$$1. (C_0 - Y_0) = 95$$

$$2. UB_0 = 91; \frac{1}{4} UB_0 = 24$$

$$(C_1 - Y_1) = 119, \text{ or } 120 \text{ to two significant digits.}$$

TABLE II-29

Excess of Cash Outlay over Monthly Income During Unemployment

	One Person Household	4-Person Household, Claimant as Head	4-Person Household, Claimant as non-head	
Pittsburgh, Pa.	41	79	n.a.	Excess
	103	192		Income
	.398	.411		Excess/Income
Florida	57	157	75	
	86	120	320	
	.662	1.308	.234	
South Carolina	37	75	52	
	92	173	344	
	.402	.434	.151	
New York State	96	156	125	
	134	194	430	
	.716	.804	.290	
Oregon	55	129	86	
	139	229	440	
	.396	.563	.195	
Missouri	85	117	56	
	116	209	416	
	.733	.559	.135	
	62	119	79	Average Excess
	112	186	390	Average Income
	.554	.639	.202	Average Excess/Income
Total averages with weights of 1-2-1:				Excess 95
				Income 218
				Excess/Income .436

Source: Table C-1, Adequacy of Benefits under Unemployment Insurance, Bureau of Employment Security, U.S. Department of Labor (Washington: 1958).

All surveys were conducted between Fall 1956 and Spring 1958, except that for Pittsburgh (Fall 1954).

TABLE II-30

Cash Outlay and Unemployment Benefits During Unemployment

	One Person Household	4-Person Household, Claimant as Head	4-Person Household, Claimant as Non-Head	
Pittsburgh, Pa.	144	271	n.s.	Cash outlay
	93	119	n.s.	Unemployment benefits
Florida	143	277	395	outlay
	56	n.s.	n.s.	benefits
South Carolina	129	248	396	outlay
	61	61	62	benefits
New York	230	350	555	outlay
	91	104	88	benefits
Oregon	194	358	526	outlay
	100	118	81	benefits
Missouri	201	326	472	outlay
	96	103	89	benefits
	174	305	469	Average cash outlay
	83	101	80	Average unemp. benefits
Total averages with weights of 1-2-1:				Average cash outlay - 313
				Avg. unemploy. benefits- 91
From previous table:				Average Income - 218
				(unemp. bnfts. + other)
				Av. Excess of Outlay -
				over income - 95

In Table II-29 the excess of monthly expenditures over income are shown during each quarter of the contraction for experiments M.B.-1, 5, and 7 and D.E.F.-1. On the basis of these estimates the drain from the financial intermediaries will be approximately \$1 billion a month by the eighth quarter of a recession as severe as M.B.-7.

If we take the more extreme estimate—12 million unemployed—the drain from the financial intermediaries, assuming that each unit uses \$120 of private financial resources per month will be \$1,440 million per month.

We now have to see whether a representative financial intermediary can stand its share of such spending in excess of disposable income.

F. Pressure on Savings Intermediaries Due to a Severe Recession

A recession as severe as those generated by the M.B. computational experiments will result in pressures on the savings intermediaries whose liabilities are the largest part of the nonmonetary liquid assets of households. These pressures will be felt on both the asset and the liability side of their balance sheet.

On the asset side we ignore any possibility of a severe decline in the market value of the assets which are not in default occurring independently of a need for the financial intermediaries to obtain money by selling their assets. As a result, the only pressure on the asset side of savings intermediaries that will occur as a result of a severe recession will be due to defaults by borrowers.

On the liabilities side of the balance sheet of the savings intermediaries, the pressures due to a recession will be the result of an attempt by households with decreased disposable incomes to maintain their consumption standards. This will result in a rise in withdrawals and a fall in new deposits in the depository institutions. For life insurance companies the events analogous to withdrawals are the cancellation of policies and the policy loans: both of these are ways in which households can tap the cash surrender values of the policies. In almost all important respects United States Government savings bonds are close substitutes for the liabilities of the savings intermediaries. The financial pressures associated with a recession will result in an increase in the rate at which they are redeemed.

Even though we will look at the relations between an economic contraction and all of the significant classes of financial institutions, primary attention will be paid to the savings and loan associations. This is in good part due to the availability of data

and the simplicity of their balance sheets. However their rapid rate of growth, the relative thinness of their equity positions, and the relative weight of the risk assets in their portfolios, as well as the large number of small savings and loan associations, make them likely candidates for the weak link in the financial structure of the economy.

In Table II-31 the balance sheets as of the end of 1958 of all savings and loan associations and all mutual savings banks are presented. As far as the owners of the liabilities of these two classes of institutions are concerned, these two sets of institutions perform the same function. In Table II-32 the mortgages owned by financial intermediaries are classified as to whether or not they are insured or guaranteed by the government. Using cash, government debt and government insured and guaranteed mortgages as "riskless" assets in the sense that they are to all extents and purposes free of default risk, in Table II-33 the amounts and the ratios of riskless assets to total assets for the most important savings intermediaries as well as the ratios of owners equity to total assets are presented. In both the percentage of riskless assets to total assets and the percentage of owners equity to total assets, mutual savings banks are better protected against financial distress than are savings and loan associations.

Life insurance companies held 22 percent of their total assets in riskless form and their equity accounts were 8.5 percent of their total liabilities. (Stock life insurance companies which held about 27 percent of the total assets had only \$745 million in their capital account.) However, in evaluating life insurance company balance sheets two problems arise: 1) the possibility that there are hidden surpluses in policy reserves and 2) the possibility that the policy reserves do not measure the cash surrender value of their liabilities in the same way that deposits measure the cash surrender value of the liabilities of savings and loan associations and mutual savings banks. Of the total policy reserves in 1958 of \$88.6 billion only some \$52.9 billion were for ordinary life and \$4.2 billion were for annuities. My "guess" is that the liquid asset component of policy reserves at the end of 1958 was \$57.1 billion; the other \$31.5 billion represented reserves that could not be tapped by individuals allowing a policy to lapse or by borrowing on the policy.

Because of the difficulties in interpreting the life insurance data and because of the relatively greater security of the mutual savings banks, primary emphasis is placed upon the study of the financial pressures that a severe recession will place upon savings and loan associations in what follows.

In Tables II-35 and II-36 two estimates of the total liquid assets of households are presented. We can assume that the private

TABLE II-31

Balance Sheet of Mutual Savings Banks and
Savings and Loan Associations
End of 1958

Mutual Savings Banks			
Assets		Liabilities	
Mortgages	23.0	Deposits	34.0
Other Loans	.3	Other	.5
U.S. Gov't. Debt	7.3	Surplus	3.2
State & Local Bonds	.7		
Corporate & Other Bonds	5.0		
Cash	.9		
Other	2.5		
	37.8		37.8

Savings and Loan Associations			
Assets		Liabilities	
Mortgages	45.6	Savings Capital	48.0
U.S. Gov't. Debt	3.8	Reserves	3.8
Cash	2.6	Borrowed Money	1.4
Other assets	3.1	Loans in Process	1.2
	55.1	Other	2.7
			55.1

Source: Federal Reserve Bulletin, June 1960.

TABLE II-32

Mortgages Owned by Financial Intermediaries*
By Type of Mortgage
Billions of dollars, end of 1958

	Insured		Total	Percent of Total
	F.H.A.	V.A.		
Commercial Banks	5.48	3.34	9.78	18.59
Mutual Savings Banks	5.50	8.36	7.07	20.93
Life Insurance Companies	7.44	7.43	19.52	34.39
Savings and Loan Associations	2.21	7.08	36.34	45.63
			80	

*Residential mortgages for commercial and mutual savings banks, nonfarm mortgages for life insurance companies, and total mortgages outstanding for savings and loan associations.

Source: Federal Reserve Bulletin.

TABLE II-33

Riskless Assets and Equity
Mutual Savings Banks, Savings and Loan Associations and
Life Insurance Companies
End of 1958

	Mutual Savings Banks	Savings and Loan Associations	Life Insurance Companies
Government debt	7.3	3.8	7.2
Cash	.9	2.6	1.4
FHA mortgages	5.5	2.2	7.4
VA mortgages	8.4	7.1	7.4
Total "riskless"	22.1	15.7	23.4
Total assets	37.8	55.1	107.6
% Riskless assets	58	28	22
Owners "equity**"	3.2	3.8	9.1
% Owner's equity to total assets	8.5	6.9	8.5

*Surplus, reserves, common stock.

TABLE II-34

Balance Sheet*
Life Insurance Companies
End of 1958
(Billions of dollars)

Assets		Liabilities	
U.S. Gov't. Securities	6,868	Policy Reserves	88,604 [†]
Foreign Gov't. Bonds	349	Dividend Accumulations	2,912
State, Provincial, Local Bds.	1,135	Set Aside for Dividends	1,509
Railroad Bonds	3,774	Other Obligations	5,748
Public Utility Bonds	16,455	Special Surplus Funds	1,865
Industrial & Misc. Bonds	25,105	Unassigned Surplus	6,197
Stock	4,561	Capital Stock	745
Mortgages	39,197		
Real Estate	3,651		
Policy Loans	4,618		
Miscellaneous Assets	3,258		
Cash	1,366		
	107,580		107,580

[†]Of the Policy Reserves some \$52,855 million were for ordinary life and some \$4,238 million were for individual annuities. I assume that this makes the maximum cash surrender value of all life insurance obligations \$57,093 million, and that the rest of the policy reserves could not be tapped by loans or lapses.

Source: Life Insurance Fact Book, 1960, pp. 60 ff.

TABLE II-35

Nonmonetary Liquid Assets,
End of Quarter, 1957:2

	Amount	Percent of Total Liquid assets
1. Time Deposits, Commercial Banks	55.8	.223
2. Savings and Loan Association Shares	39.7	.158
3. Time Deposits, Mutual Savings Banks	30.9	.124
4. Credit Union Shares	3.1	.012
5. Postal Savings	1.5	.006
6. Total Deposits	131.0	.523
7. Policy Reserves [†]	70.5	.281
8. Total Private Liabilities	201.5	.804
9. U.S. Savings Bonds	49.1	.196
10. Total Liquid Assets	250.6	1.000

	Percent of Total Deposits
1. Time Deposits, Commercial Banks	.426
2. Savings and Loan Association Shares	.303
3. Time Deposits, Mutual Savings Banks	.236
4. Credit Union Shares	.024
5. Postal Savings	.011

[†]Excluding pension fund reserves.

Source: Flow-of-funds data.

TABLE II-36

Nonmonetary Liquid Assets of "nonfinancial Sectors"

	End of:					% of Total Liquid Assets					% of Total Deposits				
	1939	1945	1957	1958		1939	1945	1957	1958		1939	1945	1957	1958	
Time Deposits	15.3	30.1	56.1	63.2		.258	.219	.210	.221		.487	.536	.417	.421	
Savings & Loan Shares	4.1	7.4	11.9	17.9		.069	.054	.157	.167		.131	.132	.312	.319	
Mutual Savings Deposits	10.5	15.3	31.7	34.0		.177	.111	.119	.119		.334	.273	.236	.227	
Credit Union Shares	.2	.4	3.4	3.8		.003	.003	.013	.013		.006	.007	.025	.025	
Postal Savings Deposits	1.3	2.9	1.3	1.1		.022	.021	.005	.004		.041	.052	.010	.007	
Total Deposits	31.4	56.1	134.4	150.0		.530	.407	.504	.524						
Policy Reserves	25.8	38.7	84.1	88.6		.436	.281	.315	.309						
Total Private Liab.	57.2	94.8	218.5	238.6		.966	.688	.819	.833						
U.S. Savings Bonds	2.0	42.9	48.2	47.7		.034	.311	.181	.167						
Total Liquid Assets	59.2	137.7	266.7	286.3		100.0	100.0	100.0	100.0						

Source: John G. Gurley, "Liquidity in Financial Institutions in Post-War Period," Study of Employment, Growth and Price Level, Joint Committee on Economic Report, Table 1, p. 65.

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financial resources owned by the households with unemployment which will be drawn upon to finance spending in excess of disposable income will be derived from these sources. To estimate the financial pressures on the various financial intermediaries we can assume that the pressure will be in the same proportion as their liabilities are to total liquid assets of households. If we do this we will be treating the savings bonds and the policy reserves on the same basis as the other liquid assets.

We can readily assume that no difficulties confront the federal government in refinancing its debt so that any net decline in savings bonds will result in a net increase in conventional bonds. In fact we hope we can assume that in a recession this will be done in such a way that no pressure upon the financial resources of the community results from this change. That is, all that will happen is that the nonbank public will decrease its holdings of savings bonds and increase its holdings of demand deposits and currency.

Life insurance policy reserves are not fully equivalent to depository liabilities and savings bonds as a liquid asset. First of all there is the problem raised a few pages back as to whether all of the policy reserves are a liquid asset of households, or whether only some 60 to 70 percent of policy reserves are assets households can voluntarily tap. In Table II-37 the amount of policy loans, and policy loans as a percentage of total assets for 1920 to 1959, are presented. In terms of historical percentages of policy loans in the portfolio of insurance companies, the 1958-59 figures of 3.9 and 4.1 percent are low. If the same order of magnitude of the ratio of policy loans to total assets as ruled in the 1920's and 1930's were to be re-established, the life insurance companies would face a cash drain of some \$10 to \$14 billion.

In addition to policy loans, a recession may make a substantial rise in the cash flow from life insurance companies due to the voluntary termination of policies. Certainly an analysis more comprehensive than the available data permit is needed of the cash flows and the asset position of life insurance companies: as far as we have been able to find, there are no available data on the cash flow from life insurance companies due to the lapsing of policies.

In addition to the difficulties of acquiring significant data on life insurance companies, there is some doubt in my mind whether borrowing on life insurance or allowing a policy to lapse is quite equivalent to withdrawing a deposit from an account. Also, do households subject to unemployment have much in the way of life insurance policies with cash surrender values?

TABLE II-37

Policy Loans
U.S. Life Insurance Companies

Year	Amount, Billions	Percent of Life Insurance Co. Assets	Year	Amount, Billions	Percent of Life Insurance Co. Assets
1920	.859	11.7	1940	3.091	10.0
1921	1.058	13.3	1941	2.919	8.9
1922	1.141	13.2	1942	2.683	7.7
1923	1.198	12.7	1943	2.373	6.3
1924	1.323	12.7	1944	2.134	5.2
1925	1.446	12.5	1945	1.962	4.4
1926	1.559	12.4	1946	1.894	3.9
1927	1.785	12.4	1947	1.937	3.7
1928	2.000	12.5	1948	2.057	3.7
1929	2.379	13.6	1949	2.240	3.7
1930	2.807	14.9	1950	2.413	3.8
1931	3.369	16.7	1951	2.590	3.8
1932	3.806	18.3	1952	2.713	3.7
1933	3.769	18.0	1953	2.914	3.7
1934	3.658	16.7	1954	3.127	3.7
1935	3.540	15.2	1955	3.290	3.6
1936	3.411	13.7	1956	3.519	3.7
1937	3.399	13.0	1957	3.869	3.8
1938	3.389	12.2	1958	4.188	3.9
1939	3.248	11.1	1959	4.618	4.1

Source: Life Insurance Fact Book, 1960, p. 88.

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Because of these special problems surrounding policy loans and savings bonds, an estimate of the pressure upon the savings and loan associations will be made under the assumption that withdrawals from savings and loan associations due to unemployment are in the same proportion as the savings and loan "shares" are to total deposits in savings intermediaries.

In Table II-38 the estimated spending in excess of disposable income by households with unemployment is presented. In M.B. Experiment 1 in the monthly rate of spending by households with unemployment in excess of disposable income during the eighth quarter of the contraction will be \$688.2 billion per month, in M.B. Experiment 7 this will be \$1,018.3 billion per month and the arbitrary assumption of 12 million unemployed yields \$1,440 billion per month. If we use the weights derived from all liquid assets, the pressure on the various savings intermediaries would be as given in Table II-39(a); if we used the weights derived from the deposit intermediaries, the weights would be as in Table II-39(b). Is the flow of cash to these institutions due to their portfolio sufficient to meet these drains?

The flow of money to the savings and loan associations on portfolio account is relatively easy to measure. Almost all of their assets consist of mortgages, and if we assume that all the mortgages they own are fully amortized, then we can, by "guessing" at the average age of the mortgage portfolio, estimate the monthly contract payment, which is both a repayment of the principal and a payment of interest. If we then "guess" at the "expenses" of the savings and loan institutions, we can estimate how much is available to meet the cash flow. If the estimated cash drain is greater than the estimated money flow to the institutions, we can assume that there would be a need to finance their cash drain by selling their assets. This effect can lead to a collapse in the market value of "mortgages"—which would imply that savings and loan associations would be in financial distress.

In Table II-40 the monthly payments of principal and interest per \$1,000 of original principal on fully amortized contracts at various lengths and various interest rates are given. If we look at the 6 percent interest rate payments that are shown we can see that \$5,000 at 6 percent for 20 years requires \$35.85 per month as a payment; \$4,000 at 6 percent for 13 years requires \$35.28 per month and \$3,000 at 6 percent for 9 years requires \$36.03 per month. Ignoring the "small" differences in the payments we can argue that in an "even payment" contract at 6 percent per year on the unpaid balance that has an original life of 20 years, 1/5 of the original amount is repaid in the first 7 years and 1/5 of the original amount is repaid in the last 2 1/2 years. It does not make any difference if the contract is originally written for say 10 years or

TABLE II-38

Estimated Spending in Excess of Disposable Income
Various Computational Experiments
First 8 Quarters of a "Contraction"
(Millions of dollars per month)

	Experiments				Arbitrary
	D.E.F.-1	M.B.-1	M.B.-5	M.B.-7	
1957:3	288.4	288.4	288.4	364.3	
4	347.4	334.3	340.9	422.3	
1958:1	393.3	373.6	419.5	546.5	
2	445.7	445.7	498.2	645.8	
3	465.4	531.0	576.7	761.6	
4	458.8	596.4	643.9	861.0	
1959:1	432.6	648.9	707.8	945.8	
2	399.9	688.2	760.3	1,018.3	1,440.

TABLE II-39

Monthly Withdrawals from Various Financial Institutions
at Estimated 1958:2 Rate of Spending by Unemployed
Different Experiments, Different Weights to Financial Institutions

	M.B.-1	M.B.-7	A.R.B.	Weights
<u>Part (a): Weights as among Savings Institutions</u>				
Time Deposits in Commercial Banks	151.4	224.0	316.8	22
Savings and Loan Associations	117.0	173.1	244.8	17
Mutual Savings Banks	82.6	122.2	172.8	12
Life Insurance Companies	206.5	305.5	432.0	30
<u>Part (b): Weights as among Depository Institutions</u>				
Time Deposits in Commercial Banks	269.0	427.7	604.8	42
Savings and Loan Associations	220.1	325.9	460.8	32
Mutual Savings Banks	158.3	234.2	331.2	23

TABLE II-40

Money Flows per Month to Owner of Fully Amortized Contracts
per \$1,000 of Original Contract
Various Interest Rates and Terms

	Interest Rate	Term	Monthly Payment
<u>A. Interest on Outstanding Balance (Mortgage Contracts)</u>			
	9%	2 years	45.69
	9%	3 years	31.80
	6%	2 1/2 years	35.98
	6%	3 years	30.43
	6%	5 1/2 years	17.83
	6%	9 years	12.01
	6%	10 years	11.11
	6%	13 years	8.82
	6%	20 years	7.17
	5%	10 years	10.61
	5%	20 years	6.60
	5%	25 years	5.82
<u>B. "Adding on" interest (Installment Credit)</u>			
	9%	2 years	49.17
	9%	3 years	35.27
	6%	2 1/2 years	38.33
	6%	3 years	32.77

it has 10 more years to run, the payment per month per thousand of unpaid balance is as it is given by the table. Thus if the payment per month is \$35.85 on a 6 percent contract with 10 years to run, the unpaid balance when there are 10 years left to maturity is \$3,227.

We have no way to estimate directly the average remaining life of the mortgage contracts owned by savings and loan associations. Given the growth rate of their portfolios, the average term to maturity is far longer than if the savings and loan associations were not growing so fast. In addition, since the principal amount owed is not reduced in a straight line, even in a portfolio where the same amounts of mortgages are issued each year for the same term the weighted average to maturity of the portfolio will exceed the half-life of the contracts. As a result, we feel that 1 percent of the mortgage portfolio is a generous estimate of the monthly flow of funds to savings and loan associations due to the contracts they own.

Incidentally, note that with 6 and 9 percent 3-year contracts, the monthly cash flow to the organization holding these contracts can exceed 5 percent of the value of the contracts outstanding. This is one source of the liquidity of consumer credit houses.

At a rate of 1 percent of the mortgage portfolio per month, the cash flow to the savings and loan associations, with a mortgage portfolio of some \$40 billion, is \$400 million. At a 5 percent per annum rate on the outstanding balance, \$200 million of this is repayment of principal and \$200 million is repayment of interest. If expenses are one-half of income then there is a \$300 million monthly flow to the savings and loan associations which can be used to meet the cash drains due to withdrawals by households with unemployment. This is larger than the estimated cash drain from savings and loan associations if we assume that the drain from the savings and loan associations would be consistent with the weight of their liabilities in the total liquid assets of households. If we assume that withdrawals will follow the weights of savings and loan associations among the deposit-receiving institutions, then the cash drain from withdrawals would exceed receipts in the eighth period for both M.B.-7 and the arbitrary 12 million unemployment experiment.

If there is no net drain from the savings and loan associations, then the repayment of principal and interest earnings in excess of expenditures that takes place each month provides a source of funds that can be used to purchase new mortgages. As soon as a net cash drain from savings and loan associations develops, the funds available to finance new construction decrease. Hence a feedback from unemployment to the financing terms for new construction can be set up, so that the financing terms available for new construction may stiffen at the wrong time.

The above exploration of the relations between spending by the households with unemployment and the financial position of savings and loan associations depends upon some rather heroic assumptions. A more formal analysis of the same problem was carried out for a number of the computational experiments.

From the available quarterly data for the period 1932:1 through 1958:4, least square regression lines were fitted for new deposits and withdrawals from savings and loan associations. New deposits were found to depend upon quarterly disposable income and withdrawals upon the total deposits and the change in income. As a result an estimated net increase in shares relation was derived. The equations are:

$$1) \text{ Withdrawals} = .067 + .073 D_{t-1} - .057 (YD_t - YD_{t-1})$$

MINSKY

$$2) \text{ New deposits} = -4.68 + .103 YD_t$$

$$3) \text{ Net increase in shares} = 4.747 + .163 YD_t - .057 YD_{t-1} - .073 D_{t-1}$$

where D_{t-1} = outstanding deposits end of previous quarter
 YD_t = quarterly disposable income.

Using as the initial condition that total deposits in period $t-1$ were \$39.798 billion, the net change in shares outstanding for D.E.F.-1, M.B.-1, 5, and 7 are presented in Table II-41. These computations show that in D.E.F.-1 there was only a slight decrease in total shares outstanding during the fourth and fifth quarters of the period. Under the M.B. experiments the net drains of shares took place at a much more rapid rate, and in M.B.-7 the net decrease in shares exceeded \$1 billion a quarter in the eighth quarter of the contraction.

Using 1 percent of deposits outstanding as the gross flow of funds per month on account of the amortized contracts outstanding, beginning only with the eighth quarter in experiment M.B.-7 does a negative cash flow turn up. Of course from this cash flow the expenses of the savings and loan associations have to be met. If we assume that these expenses are one-fourth of the total cash flow then in M.B.-7 the net drain would be in excess of \$90 million per month during the eighth quarter of the recession. This would imply a need for intervention in the home mortgage market or a tendency for savings and loan associations to be in financial distress.

It is unlikely that an 18 percent decline in income would not be associated with a significant rise in the default rate on such mortgages. If during the eighth quarter 5 percent of the outstanding mortgages are in default, the net drain of cash would be in excess of \$105 million per month.

However, note in Table II-42 that even in the extreme M.B.-7 computational experiment, if we allow \$105 million as the sum of expenses plus defaults, as late as the first quarter of the second year the savings and loan associations would have a positive net cash flow. The need to finance the net withdrawals by using the amortization payments does imply that the mortgage market will be tight. This may be one of the feedbacks that could reinforce the contraction.

Of course the withdrawals, deposits and default estimates are for the population as a whole. The relative pressure can be very high on some and very low on other institutions. In a situation where financial distress seems close it is not to be expected that the cash flow surplus associations would be purchasers of the assets which cash flow deficit units would be trying to sell. The pressure on

TABLE II-41

Estimated Net Change in Savings and Loan Shares
Various Computational Experiments
 (Billions of dollars)

	Quarterly Net Change in Shares (+ increase - decrease)			
	D.E.F.-1	M.B.-1	M.B.-5	M.B.-7
1957:3	.201	.346	.346	.346
4	.092	.115	-.018	-.206
1958:1	.023	.131	-.161	-.404
2	.084	-.067	-.293	-.589
3	.037	-.218	-.506	-.805
4	.062	-.298	-.563	-.898
1959:1	.199	-.293	-.624	-.970
2	.330	-.308	-.627	-1.063
3		-.453	-.783	-1.152
4		-.511	-.831	-1.201
1959:1		-.530	-.814	-1.203

TABLE II-42

Net Cash Drain on Savings and Loan Associations, Monthly
(Amortization of Contracts = .01 Deposits outstanding)

	M.B.-1 Net Inc. in Shares Monthly	Amortiza- tion of Contracts	Monthly Net Cash Flow		M.B.-5 Net Inc. in Shares Monthly	Amortiza- tion of Contracts	Monthly Net Cash Flow
1957:3	.115	.401	.516	1957:3	.115	.401	.516
4	.038	.403	.441	4	-.006	.401	.395
1958:1	.044	.405	.449	1958:1	-.054	.400	.346
2	-.022	.404	.382	2	-.098	.397	.299
3	-.073	.402	.329	3	-.169	.392	.223
4	-.099	.399	.300	4	-.188	.386	.198
1959:1	-.091	.396	.305	1959:1	-.208	.380	.172
2	-.103	.393	.290	2	-.209	.374	.165
3	-.151	.389	.238	3	-.261	.366	.105
4	-.170	.383	.213	4	-.277	.358	.081
1960:1	-.177	.378	.201	1960:1	-.271	.349	.078

	M.B.-7 Net Inc. in Shares Monthly	Amortiza- tion of Contracts	Monthly Net Cash Flow		D.E.F.-1 Net Inc. in Shares Monthly	Amortiza- tion of Contracts	Monthly Net Cash Flow
1957:3	.115	.401	.516	1957:3	.067	.400	.467
4	-.069	.399	.330	4	.031	.401	.432
1958:1	-.135	.395	.260	1958:1	.008	.401	.409
2	-.196	.389	.193	2	-.028	.400	.372
3	-.268	.381	.113	3	-.012	.400	.388
4	-.299	.372	.073	4	.021	.401	.422
1959:1	-.323	.363	.040	1959:1	.066	.403	.469
2	-.354	.352	-.002	2	.110	.406	.516
3	-.384	.341	-.043				
4	-.400	.329	-.071				
1960:1	-.401	.317	-.084				

the secondary market for mortgages will be greater than the \$100 million or so per month net deficit in cash flows that the analysis shows.

It is possible for a decline in income as severe as M.B.-7 generates to result in many savings and loan associations being in financial distress. From widespread financial distress to generalized financial crisis is not a big step for an important financial institution.

G. Disposable Income and Consumption and Effects of Social Security and Other Transfer Payments

Two additional sets of information were extracted from the work sheets for the various computational experiments. These are: 1) Excess of disposable income over consumption in the various experiments, and 2) the net payments on social security account.

In all the D.E.F. and M.B. experiments, the excess of disposable income over consumption was positive during the first eight quarters of the experiments. However, beginning in the ninth quarter the consumption estimate for M.B.-7 exceeded disposable income. The fact that the over-all excess declines from an annual rate of \$20.4 billion to \$5.1 billion at the beginning of the second year implies that many households must finance a part of their consumption from sources other than disposable income during the second year of the severe recession. These computations are in Table II-43.

In Table II-44 the excess of government transfer payments over the withdrawals from income due to contributions to social security, etc. are given for the various computational experiments. The fact that the deficit on these accounts rises from \$5.3 billion annual rate to a \$17.2 billion annual rate by the eighth quarter for M.B. Experiment 1 and \$19.3 billion for the eighth quarter for M.B. Experiment 5 is indicative of how such transfer payments sustain disposable income. Since this requires money payments from the government, the cash flow will have to be financed by the sale of bonds by the government agencies involved. Assuming that during a severe recession these bonds would be sold to the banking system, which would be able to purchase them without reducing their other assets, the contingent liability of the social security system would result in a \$14 billion (annual rate) increase in the money supply during the eighth quarter of the recession over what it would have been. Such an increase in the liquid assets of households and business should help stabilize the economy.

H. Conclusions

There seems to be little doubt that the financial pressures associated with an 18 percent decline in income over a two-year

TABLE II-43
Excess of Disposable Income over Consumption
in Various Experiments

	D.E.F.			M.B.								
	1	2	3	1	2	3	4	5	6	7	8	9
1957:3	19.7	19.7	19.7	20.4	20.4	20.4	20.4	20.4	20.4	20.4	19.7	19.7
4	21.9	21.8	19.4	15.1	13.7	15.3	14.8	13.7	15.0	8.4	12.6	12.6
1958:1	19.7	19.7	19.9	18.8	13.3	16.5	15.8	13.6	11.3	9.0	15.0	15.0
2	16.6	16.1	19.2	14.8	13.0	17.0	15.0	13.4	11.8	9.1	13.7	13.1
3	18.8	15.8	18.1	13.7	8.8	14.1	11.9	10.0	8.1	5.1	16.9	13.6
4	20.1	14.2	17.0	13.5	9.3	14.6	12.6	10.4	8.2	5.1	19.4	12.7
1959:1	21.8	14.1	16.4	13.4	8.1	14.1	11.9	9.8	7.2	4.2	22.6	12.8
2	23.0	13.7	15.8	12.4	7.7	13.9	11.4	9.7	6.6	3.9	25.4	12.8
3				7.1	2.9	9.1	6.2	5.0	.7	-1.3		
4				6.7	3.0	9.0	6.2	5.3	.3	-1.3		
1960:1				6.1	2.7	8.6	5.8	5.3	-.4	-1.4		

TABLE II-44
Excess of Government Transfer Payments
and Interest Paid by Government
over Contributions to Social Insurance

	D.E.F.			M.B.								
	1	2	3	1	2	3	4	5	6	7	8	9
1957:3	5.4	5.4	5.4	5.3								
4	7.6	7.6	8.6	7.0	7.0	7.1	7.0	7.1	3.5	3.6	3.5	3.5
1958:1	8.7	8.7	9.2	8.1	9.1	9.3	9.0	9.3	4.8	5.0	4.7	4.7
2	9.9	10.1	9.5	10.3	11.1	11.2	10.7	11.5	5.8	6.3	5.5	5.7
3	9.9	11.0	9.6	12.9	13.4	13.4	12.9	14.1	6.9	7.7	5.7	6.3
4	9.1	12.1	9.8	14.7	15.4	15.2	14.8	16.2	7.9	6.8	5.4	7.0
1959:1	7.6	12.7	10.0	16.2	17.0	16.7	16.2	17.8	8.7	9.7	4.7	7.3
2	5.8	12.8	10.3	17.2	18.4	18.0	17.4	19.3	9.4	10.5	4.4	7.4
3				19.1	20.7	20.2	19.3	21.5	10.4	11.7		
4				20.7	22.5	21.9	20.9	23.3	11.3	12.7		

period could pace many savings and loan associations, as well as other financial institutions, in a position of financial distress. Whether or not the losses that business firms can be expected to make if income dropped this sharply would result in a significant volume of defaults to the financial institutions that own business debt was beyond the scope of our study. Nevertheless the magnitude of the pressures that did build up on the savings and loan associations can be used as indirect evidence that a really severe recession can induce financial distress.

However a recession of the assumed magnitude, given financial stability during the time it develops, has to be explained. It implies a well-nigh complete collapse of private gross investment—this in spite of the relatively slow reduction in the flow of funds available to finance investment. Unless we are willing to posit the sudden autonomous exhaustion of investment opportunities, this path to financial crisis must be considered as a rather improbable one for the economy to take. A more likely course to a severe recession would involve a financial crisis that occurs earlier in the downturn.

In addition, if we posit the existence of a large government debt partially held in the form of savings bonds and a modern social security system, the need to refinance the savings bonds as they were redeemed and the social security system's need to obtain cash by selling its portfolio should result in a large increase in the money supply if the central bank behaves sensibly.

For a recession as serious as M.B.-7 to occur in a modern context it is necessary to assume that private investment can collapse even though the money supply has increased and no financial distress has occurred. Also, note that M.B.-7 assumed that income-maintaining transfer payments were cut in half; this is equivalent to having income grow without increasing welfare programs. The recent history of such programs indicates that this will not take place.

VII. CENTRAL BANKING IN A COMPLEX FINANCIAL ENVIRONMENT

A. Introduction

There is no doubt that the financial structure of the United States is more complex than it was in the 1907-13 era, when the Federal Reserve System was being discussed and organized. There is ample evidence of the decreasing importance of the commercial banks in the total financial structure, even though some evidence

exists that this decreased relative importance had been achieved by the beginning of the great depression.¹ In the original legislation and the usages which have grown up since then, two functions of the Federal Reserve System can be identified; these are: 1) a regulator of the economy and 2) a lender of last resort to the commercial banks.

In this chapter we will examine briefly how the central bank operates with respect to these functions, recall what the peculiar relation between the federal government's financial operations and the central bank necessarily is, and offer some suggestions for modifying the scope and functions of the central bank.

B. Central Bank as a Regulator of the Economy

There is no need to document the current emphasis upon the central bank as a regulator of the economy. Changes in discount rates, open market operations, and reserve requirements, as well as direct controls, are used by the Federal Reserve System to affect the volume and direction of lending. The reason given for such acts is that they will affect the level of activity in the economy. The argument as to whether the Federal Reserve Bank should operate in the short- or the long-term issues is really a debate about the relative efficacy of different types of operations in controlling the economy. In this section we will draw attention to the effects of a complex financial structure upon the efficacy of the central bank's action in controlling the economy and also point out how the stability properties of the financial system depend upon the extent to which "the economizing of cash" is carried. It is pointed out that if there is an attempt to constrain the economy by "tightening" up on money, the likelihood of financial instability increases. The active use of monetary policy in a buoyant economy implies that the central bank must stand ready to act aggressively if financial instability develops.

There is no doubt that the central bank can affect the volume and the direction of loans and investments by the commercial banks. However, in a world where a complex structure of financial institutions exists and where a large volume of short-term government securities are outstanding, the variability of velocity, that is, the responsiveness of transaction and asset cash balances to interest rate changes and the demand for financing, makes the central bank a relatively ineffective regulator of the economy.

¹Joseph Aschenheim, "Commercial Banks and Intermediaries: Fallacies and Policy Implications," Journal of Political Economy, Vol. LXVII, No. 1 (February 1959).

There is a trade-off between liquidity and the vulnerability of the financial system to financial crises and distress. A system in which there is a large amount of money relative to transactions is one in which the ratio of riskless to risk assets of the private sector is high, especially if the assets of the monetary system are heavily weighted by government debt and gold. In such a system the possibility of financial distress for a particular unit spreading to a financial crisis for the economy is slight. Continued reliance upon monetary policy to restrict aggregate demand in a period in which there is a secular buoyancy to the economy will lead to an economizing of cash balances. In place of increased activity being financed in part by increases in the quantity of money, increased activity will be financed almost entirely by substituting debt assets of private units for money in portfolios (or the monetary system may sell government debt to private units and acquire private debt). At every level in the economy such substitutions imply that each unit is less well able to withstand an interruption in its cash receipts; a given interruption of cash flows, say on income account, will now lead to a larger amount of portfolio changes at all levels in the economy.

Even with a relatively steady easy money situation a growth of risk assets *vis-à-vis* riskless assets will take place as long as the economy is growing and the growth is being powered by private demand. If the attempt is being made to constrain this growth in private demand by monetary policy, then the possibility that a financial crisis will take place increases.

If it is dangerous to use monetary policy to constrain excess demand and a fundamental buoyancy to private demand exists, then increased emphasis has to be placed upon fiscal policy. But this implies a tighter fiscal policy: more taxes, greater surpluses and smaller deficits over the short cycles. This will result in a more rapid decline of the government debt during a sustained boom than would otherwise occur. But the government debt held by the private sectors and the monetary system tends to stabilize the financial system. Hence the stabilizing influence of government debt is decreased if the attempt to restrain growth is carried out by means of a tight fiscal policy and an easy monetary policy.

Neither of the alternatives, tight money and a relatively lax fiscal policy or a relatively easy money situation combined with a tight fiscal policy, which can be used to restrain excess demand in an inflationary situation due to private demand, is without side effects which adversely affect the stability of the financial system. As a result the criterion, "What are the effects of the alternative policies upon the stability of the economy?" does not result in a clear-cut choice between policies. The actual choice of policy must rest upon other secondary grounds.

A great deal of weight in choosing the mix of monetary and fiscal policies must be placed upon the extent and the scope of the government's responsibility for the maintenance of financial stability and aggregate demand in times of recession. If the government will not act vigorously through its fiscal operations to restore or increase income, then the burden will necessarily fall upon the central bank. If the central bank is to increase effective demand when it makes credit available through the commercial banks, then interest rates and credit availability must have been an effective constraint on demand during the previous boom. Hence, the policy combination of tight money and a relatively easy fiscal policy during a boom is necessary if the policy combination of easy money and a relatively unchanged schedule of fiscal operations during a recession is to be effective. A federal government that is wary of increasing government debt and responsibilities has to lean heavily upon traditional monetary policy.

On the other hand, if the federal government has extensive underwriting commitments to disposable income (social security, unemployment compensation, etc.), then the money market must be so ordered that the government will be able to sell large amounts of debt instruments when these commitments become current. If easy money is being introduced at this time after a period of tight money, all the "hesitations" about taking a position in a debt asset which, according to experience and policy declarations will later fall in price, will be operative. Even though the government cash deficit has become an expansionary factor, and even though the Federal Reserve System is trying to lower interest rates, the long-term interest rate need not come down appreciably due to a fear of losses when long-term rates rise.

As a result of the existing widespread government commitment to maintaining economic stability by use of fiscal operations, it seems desirable to experiment with a policy mix that contains a relatively easier and steadier monetary policy and place more emphasis upon fiscal policy both in terms of tighter fiscal policy during periods when inflation threatens and an easier fiscal policy in times of excess supply. In a privately powered buoyant economy this will result in larger surpluses and therefore more debt retirement during expansion phases than a policy mix which places more weight upon monetary policy. However the more vigorous countercyclical fiscal action this policy mix implies will yield greater deficits during the recessions. The over-all trend in the debt will depend upon exogenous factors as well as the extent and scope of the government commitment; however as full employment income grows, it is necessary to raise the income at which the budget is balanced to prevent the fiscal system from blocking the attainment of full employment. Such a fiscal policy implies that the debt will not be reduced rapidly, if at all.

In the light of these considerations what has been called the central bank's dynamic functions should recede into the background. The central bank's dynamic function should take the form of a regular systematic increase in the reserves of the commercial banking system. Over the long run these reserves should be furnished in exchange for government debt. The central bank's major dynamic function is to provide a stable monetary environment. Discretion remains an essential element in monetary policy, since the meaning of a stable monetary environment changes as the economy and particularly the financial system evolve. No rule can be laid down once and for all as to how rapidly the money supply should increase; what the ratio between the money supply and the national income or between the money supply and other financial assets should be cannot be determined by any magic formula or by an examination of the past. The discretionary monetary policy that remains will not involve the central bank in the extensive day-to-day interventions in the money market on its own initiative, that it now carries on.²

C. The Central Bank as the Lender of Last Resort

Even though the central bank's significance as a short-run regulator of the economy is decreased by the growth of the non-monetary financial intermediaries, and even though the central bank should be less ambitious in the direction of the day-to-day control of the economy than its claims indicate, the existence of an ever-changing, complex financial structure increased the importance of the central bank as a lender of last resort. The central bank is responsible for the liquidity and viability of the financial system as it exists. It has the responsibility of preventing any financial crisis, no matter what its source, from developing. This implies that if widespread financial distress threatens any significant sector of the financial system, the central bank will quickly move in support of the threatened sectors to prevent the distress from developing into a crisis. As a lender of last resort the central

²Inventory disinvestment is a major factor in the mild recessions that take place during a sustained boom. As a result, an increase in business cash and in the uncommitted lending ability of banks takes place. In a world where there is a plentiful supply of short-term government securities both firms and banks are always fully invested; hence short-term interest rates will fall during a recession even in the absence of an active monetary policy. This cyclical behavior would of course be reinforced by the steady increase in bank reserves that has been suggested as the desirable longer-run policy. The behavior of the short-term interest rate is an automatic stabilizer.

bank is responsible for preventing the financial system from behaving in such a manner that the income increasing and sustaining factors are offset. Correct central bank action means that a deep recession and its resultant stagnation will not take place.

This responsibility for the performance of the economy must be carried out in such a way that severe financial losses and distress for any particular unit remain possible. The "bailing out" action should be for the financial system, not for any particular unit. Individual lack of prudence should be punished by losses, but if the financial repercussions to such punishment threaten to be so wide that the probable result will be to induce a serious decline in investment and consumption, then the central bank must intervene.

The Federal Reserve System as it is organized and as it has functioned is a lender of last resort to the commercial banks. The Federal Reserve System has even been unwilling to regularize the access to the discount window of so important a money market intermediary as the Government bond dealers. As the Government bond dealer must have a guaranteed refinancing source in case they are unable to borrow enough from their normal sources to maintain their position, the Federal Reserve System has agreed to a subterfuge by which one of the New York City banks guarantees financing to the Government bond dealers and this bank in turn has access to the discount window on an unrestricted basis.

There is no virtue, in and of itself, to the British technique of central bank discount operations in which the Bank of England lends to the discount houses and not to the commercial banks. However the British type of relations between the central bank and the financial institutions makes everyone concerned recognize that the central bank's responsibility is to aid in achieving the proper functioning of the economy and not to protect any particular institution. If the Government bond dealers play a key role in evening out the reserve position of the commercial banks and if they finance their position by borrowing temporary excess reserves from commercial banks or otherwise idle cash balances from corporations, the central bank must guarantee that no wave of general illiquidity can result from the lack of liquidity of these institutions. Similarly, if consumer finance houses become issuers of liabilities that are considered well-nigh money by the lender, then the central bank must protect the economy against the repercussions which might arise due to the illiquidity of these financial institutions.

Wherever a potential source of large-scale cumulative illiquidity exists the central bank must stand ready in times of crises to intervene. The central bank, for instance, should have stretched its responsibility and made it possible to maintain asset values on the stock exchange after some initial decline in stock prices in 1929.

For by 1929 the inflated prices of common stocks had been built into the asset structure of the financial system, so that any severe decline of stock prices threatened a financial collapse.

It is interesting to see that the various financial institutions which are cut off from the direct use of the central bank as a lender of last resort do in fact have available sources from which they can refinance their position in case of emergency. No institution would knowingly put itself in the vulnerable position that a Government bond dealer, a consumer finance house, a mutual savings bank, and a savings and loan association is in, without having some guaranteed way in which it can, if necessary, refinance its position. The worst thing that could happen to the solvency of any financial institution is a forced sale of its assets in order to acquire cash. Imagine what would happen to asset values if there were a need to liquidate Government bond positions by the Government bond dealers or if the sales finance companies were suddenly to try to sell their portfolios of consumer installment paper on some market. In order to prevent this type of forced liquidation of assets, the financial intermediaries protect themselves by having alternative financing sources, i.e., by having "de facto" lenders of last resort. These "de facto" lenders of last resort ultimately must have access to the Federal Reserve System in times of potential crisis, and we will have to find out how this indirect access functions for a number of cases.

Today the Government bond dealers normally finance their position by means of repurchase agreements with nonfinancial corporations, states, local governments, foreign central banks, etc. They also have lines of credit at some commercial banks. These sales and repurchase agreements of the Government bond dealers are essentially loans. The form that is used is economically a fiction, although it does have some legal and accounting rationale. If a lender, or alternatively a purchaser, desires to call the loan before its due date or to sell back the issue used in the repurchase agreement prior to the agreed upon date, the Government bond dealer normally tries to accommodate the lender. Hence the loans involved in repurchase agreements are almost equivalent to demand loans. The Government bond dealer unable to use the central bank discount window is able to refinance his position if the need arises by borrowing at the previously mentioned New York City bank. This New York bank will lend to the Government bond dealers regardless of its own money position because of the privileged position it occupies at the Federal Reserve Bank of New York. The Federal Reserve Bank apparently will lend to this bank without limit as long as the bank is forced to use the discount window because of its activity in financing the Government bond market.

The sales finance companies have somewhat more complex financing arrangements. The sales finance companies maintain

lines of credit at the giant commercial banks around the country. A major portion of these lines of credit is kept open, or unused, most of the time. The basic position of the sales finance companies is financed by long-term bonds and by short-term borrowing on the open market from corporations, etc. Whenever funds available on the short-term market decrease or there is sudden increase in their need for money, the consumer credit houses will draw upon their lines of credit at the commercial banks. Once the unused lines of credit at the commercial banks become too small relative to the amount of their short-term borrowings from nonbank sources, they free their lines of credit by borrowing on the long-term market.

It is possible that the consumer credit houses are forced to go to the long-term market at a time when long-term lending is not readily available due to uncertainty. As a result, the consumer credit houses can become unwilling to extend credit to finance consumer purchases at a time when aggregate demand is declining, rather using the flow of cash due to them to reduce their indebtedness.

In addition, the commercial banks may find that the consumer credit houses normally draw upon their lines of credit at the "wrong" time. If this embarrassing behavior by the consumer credit houses results in stiffer terms being applied by the commercial banks to the consumer credit houses for their stand-by lines of credit, then all it will do is change the costs of these institutions. But if it results in a refusal of the commercial banks to extend such lines of credit, then the question as to whether these institutions should have direct access to the central bank will arise.

If a commercial bank is forced to borrow at the Federal Reserve Bank's discount window because a consumer credit house unexpectedly draws upon its line of credit, we can expect that the credit will be granted. Hence both the consumer credit houses and the Government bond dealers do have indirect access to the discount window of the Federal Reserve System; there is little doubt in my mind that in times of emergency if the commercial banks refuse them accommodation such access will have to become direct. There is no reason why approved Government bond dealers and approved finance houses should not have access to the Federal Reserve System now, when no crisis threatens. The Federal Reserve's attitude toward such changes in its technique of operations has the appearance of a mystical transformation of a convention into a matter of ideology.

In addition to the Federal Reserve System, there are a number of other federal agencies that either insure the liabilities of financial intermediaries, guarantee the assets held by financial intermediaries, or act as a "lender of last resort" to some class of financial intermediaries. A number of these agencies center around the

home mortgage market and the specialized home mortgage banks: the savings and loan associations.

In order to make these guarantees, insurance schemes, and specialized lenders of last resort function in time of emergency, money has to be available when needed. In order to get money, these institutions either issue their own obligations, guaranteed by the federal government, or they borrow from the Treasury. But unless the Treasury resorts to printing money, the Treasury must obtain the money needed by these commitments by selling Treasury debt for cash. But the ability of the market to absorb large quantities of government debt for cash in a time of financial distress depends upon the willingness of the Federal Reserve System to furnish reserves to the market by engaging in open market operations in government debt. Hence the ability of the government's deposit insurance, the Home Owners Bank Board, FNMA, etc. to live up to their commitments depends upon the cooperation of the Federal Reserve System.

As a matter of fact, the Federal Reserve System is the lender of last resort to the "lenders of last resort" if not to the threatened institutions themselves. Is there any virtue in channeling all contacts between the Federal Reserve System and various nonbank financial intermediaries through the commercial banks or the Government bond market? The Federal Reserve System seems to feel there is. The possible ill effects of a restricted responsibility by the Federal Reserve System for financial stability are obvious. In times of potential financial crisis, the commercial banks which today must act as the middleman between some of the institutions and the Federal Reserve System may be unwilling to act. In a developing financial situation a delay while the Federal Reserve System makes up its mind to aid the nonbank institutions in distress may result in what would have been a manageable sectoral distress developing into a full-fledged crisis.

To summarize parts B and C of Chapter VII, given the complex, changing financial structure, the Federal Reserve System's role as a regulator of the economy should diminish while the Federal Reserve System's role as a lender of last resort to the financial system should increase.

D. The Central Bank and the Government

The Federal Reserve System is a part of the government even though it is not necessarily a part of the administration. The delegation of the control of the money supply to the central bank does not imply that the government cannot, if it so desires, issue money. As a result of the latent power to issue money that the government possesses, the central bank in its decision making is never free to ignore the market position of the interest-bearing government debt.

The federal government has undertaken certain income sustaining obligations and has underwritten some types of intangible assets. The fulfillment of these obligations may require the government, or its agencies, to sell Government bonds. The central bank must see to it that these bonds are easily sold for money; which means that the central bank will engage in expansionary open market operations. However this is not a discretionary open market operation designed to manage the economy by manipulating money; rather it is a natural extension of the central bank's responsibility to be a lender of last resort to financial markets as they are actually constituted.

The "independence" of the central bank is limited. It is "independent" to the extent that the position it takes is consistent with the government's position. Inasmuch as the government determines fiscal policy, to the extent that the goals and the diagnosis of the government and the central bank are the same, monetary policy of the central bank is determined. For example, if the government has a budget-spending setup so that a large surplus is generated at a potentially inflationary situation (fiscal tightness), then the Federal Reserve can follow a policy of monetary ease, whereas if the fiscal arm is not so tight during such a situation, the Federal Reserve System will have to follow a tight money policy.

As long as the types of issues the government emits can affect the operation of the economy, and as long as the Federal Reserve System engages in open market operations as a part of its control technique, it may be desirable to make the Federal Reserve System responsible for the management of the government debt. This can be done by making the Federal Reserve System the owner of the entire outstanding government debt and having the Federal Reserve System issue its own debt in order to absorb "reserves." The Federal Reserve would be managing the debt and engaging in open market operations when it issued its own debt.

E. Suggestions for Changing the Central Bank

The Federal Reserve System should be reorganized to make clear its responsibility for the prevention of a liquidity crisis for the economy. Its domain of control should be extended to cover the entire financial system. Its primary responsibilities would be to assure monetary stability, to act as a lender of last resort to the financial system, and to prevent fraud and misrepresentation. The Federal Reserve's directive to operate to achieve short-run stability of the economy should be replaced by a directive to keep stability in the financial markets and provide money for growth. The day-to-day open market operations in the money market should be replaced by easier and wider access to the discount window at posted rates to iron out temporary market difficulties. Open market operations

should be undertaken in order to effect permanent increases in the money supply. Seasonal adjustments in the money supply should be the result of discount rather than open market operations.

I envisage a Federal Reserve System divided into three divisions:

- 1) A monetary division dealing with the demand deposit sections of the commercial banks and the money market institutions.

- 2) A savings intermediary division which would deal with the time deposit sections of the commercial banks, the mutual savings banks, the life insurance companies, and the savings and loan associations, to name only the major units.

- 3) A guarantee and insurance division which would both operate the deposit insurance schemes and endorse private unit paper as the FHA and the VA now do.

The basic reasons for these recommendations are:

- 1) The Federal Reserve is an indirect lender of last resort to the money market institutions.

- 2) The various different authorities controlling or not controlling the savings intermediaries do not have a clear picture of the asset and liability structure of the units involved and of the households and firms they deal with. I do not envisage quantitative controls by the Federal Reserve System of the amount of savings intermediaries' liabilities which would or could be issued. I do envisage that the portfolios of the four classes of savings intermediaries will become more similar and that the unified control system will be a better protector of the liability owner than the present diffuse system.

- 3) The insurance and endorsement schemes are essentially central bank functions and they could not be executed, if necessary, without the central bank's cooperation. This makes it obvious that the central bank is the organization best suited to operate these guarantees.

- 4) There is a tendency for regulatory and control bodies to become spokesmen for the sectors of the economy they are designed to regulate or control. By having a single financial control agency, as broad as the domain of finance, the possibility that special sector interests will dominate decisions is reduced.