

A Flow of Funds Model and Its Implications

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I. INTRODUCTION

The events of the past few years have placed severe strains on our financial system. In 1966 and again in 1969 the stability of important types of financial institutions was called into question. The volume of net residential mortgage lending was sharply curtailed. Corporate liquidity was drawn down to dangerously low levels and commercial banks were able to accommodate their customers only by resorting to novel expedients which strained their own liquidity positions.

The cause of those strains on the system is well known. A rapid expansion of government expenditures, only partially offset by tax increases which were too little and too late, set off a boom in private investment and a demand inflation followed by a wage-price spiral. The vacillations of fiscal and monetary policy created uncertainty as to the government's ability or willingness to control inflation, and the resulting inflationary psychology fed the investment boom. This exacerbated the difficulties of controlling inflation by monetary measures.

There is little doubt that fiscal policy was the real villain of the piece. But the trials of 1966 to 1970 revealed some serious difficulties in the use of monetary policy as a stabilization instrument.

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The monetary policy of 1966 played a major role in checking the boom which began in late 1965. But one of the major components of that achievement was a 50 percent decline in housing starts. There are those who would argue that such an outcome was all to the good, since housing is, after all, a durable good whose construction can be postponed with a very small percentage decline in the output of our total housing services. But few of those who make that argument would be prepared to argue for, say, an excise tax on building or any other industry which would deliberately bring about the same result.

In 1969 the Fed again pursued a severely restrictive monetary policy. The rapid expansion of mortgage financing through Federal agencies as well as the rate ceilings on time deposits reduced — though they certainly did not eliminate — the impact of monetary restraint on the housing industry. But the resulting all-out competition for funds created liquidity problems of dangerous proportions in many sectors of the market. Fortunately, the boom was over before the Penn Central crisis, but the episode again demonstrated the importance of the side effects of over-reliance on monetary policy as a stabilization instrument.

As this is written, monetary policy has again turned toward restraint; and, once again, security market participants are fearful of another crunch, while thrift institutions and home builders interpret the statistical auguries for signs of a new wave of disintermediation.

The Quest for Reform

The events of 1966 sensitized the government, the Federal Reserve System, and the financial community to the allocational side effects of monetary policy. The government responded first by establishing “temporary” ceiling rates on saving deposits, then by restructuring the Federal National Mortgage Association (FNMA) as a quasi-private institution and greatly expanding its role in the secondary mortgage market. The Housing Act of 1968 provided for a GNMA guarantee of mortgage-backed security issues. Under its new administration, the Federal Home Loan Bank Board expanded its support of the mortgage lending operations of Savings and Loan Associations. Meanwhile, in the private sector, Real Estate Investment Trusts (REITs) began to play a role in the mortgage market while thrift institutions experimented with a variety of new forms of deposit liabilities. All these changes have reduced the instability of the mortgage market, as was shown in 1969-70. Nonetheless, everyone agrees on the need for a thorough review of our financial system.

Demand for reform almost always creates its own supply of reform proposals, and the present case is no exception. Presidential commissions, congressional committees, and private parties have brought forward proposals for changes in the structure and regulations of almost every financial institution and market.¹ Some propose more severe and detailed regulation of financial institutions and markets while others would move toward decontrol and greater reliance on market competition. Some are concerned with the stability and viability of particular financial institutions, while others are concerned with the availability and cost of funds for particular purposes. Obviously, many of the reforms under consideration are mutually contradictory. One cannot have more control and less control at the same time. Proposals aimed at improving the competitive position of mortgage borrowers may be in conflict with those aimed at improving the competitive position of state and local governments.

In view of the conflicting objectives of the various reform proposals and because of the complex interactions within the financial markets, proposals for changes in financial structure and regulation cannot be evaluated one at a time or in terms of the effects of a single change in a single market. There is, of course, sufficient controversy over the direct effects of changes in the structure and regulation of individual markets. For example, how much change in the demand for savings and loan shares would result from the extension of third party transfer powers to savings and loan associations? But even when some measure of agreement on such issues is achieved it is necessary to evaluate the probable effects of a set of reform proposals in terms of interactions in a complete financial system.

The need for analysis in terms of a complete system is apparent when one considers some of the reform proposals under consideration. One of the Hunt Commission proposals would give savings and loan associations power to extend consumer credit. Extension of consumer credit by savings and loan associations could increase their average rate of return. More important, their earnings would rise more rapidly in response to increased market rates. At the same time, the change would draw some funds from the mortgage market (except to the extent that better earnings increase deposits). But the effects do not stop there. If savings and loan associations are able to

¹For recent examples see *The Report of the President's Commission on Financial Structure and Regulation* (Hunt Commission), 1971; *The Report of the Commission on Mortgage Interest Rates*, 1969; and *Ways to Moderate Fluctuations in Housing Construction*, Federal Reserve Staff Study, 1972.

pay higher rates and therefore obtain more deposits, the fund flows to other institutions will be affected. If S&Ls make consumer loans, will the result be to increase total consumer loans or to draw business from finance companies or commercial banks? If the latter, will banks increase their mortgage acquisitions, bid for municipal securities, or compete less aggressively for deposits? Whatever action banks take will be felt in other markets. No analysis of the effects of changed S&L powers will be complete unless it deals with the whole system. Piecemeal analysis will only kick the problem around until it gets lost.

A similar argument applies to proposals to give state and local governments the option to issue taxable bonds with a federal subsidy covering part of the interest payment. Such a proposal, if adopted, will widen the market for municipal securities, reducing its dependency on commercial banks and high income individuals. But if insurance companies and pension funds were to buy substantial amounts of taxable municipal securities they would presumably buy less corporate securities. At the same time, bank funds and those of wealthy individuals would go somewhere. The side effects of the proposed change can only be analyzed by considering the reactions in a whole set of closely related markets.

The same considerations apply to the composition of the Federal debt — among maturities and between agency and Treasury securities. Different varieties of Federal securities appeal in the first instance to different segments of the market. Any change in the composition of the Federal debt will have some initial effects on the level and structure of yields. But, as the market adjusts to those initial impacts, secondary responses may cancel out the initial impact or shift it to still other parts of the market. Again, the net impact requires an analysis of interactions throughout the security markets.

The Role of Financial Models

It is implicit in all of these reform proposals that financial structure makes a difference — that the effect of any action by the monetary authority depends on the interaction between the central bank's action and the complex financial structure which links the central bank to the expenditure decisions of households, businesses, and government. That view of things seems obvious to market participants who firmly believe that changes in the powers of financial institutions, in their competitive relationships, or in the types of financial instruments in use, will surely influence the cost and availability of credit to different types of borrowers.

The importance of the financial structure has been far less obvious to economists who can readily note the ways in which a structural change appearing to favor one type of borrower by its direct effects may be cancelled by its secondary effects in closely related markets. Indeed, there are many cases in which the effects of institutional gadgetry all "come out in the wash." Nonetheless, economists have been giving increasing recognition to the importance of structural arrangements which transfer risk from risk-averse wealth holders to those who are less risk averse or to those who eliminate risk through pooling. At the same time, economic theorists have been giving increasing recognition to the role of transactions costs and the cost of obtaining information, factors which can be significantly affected by the institutional structure. Thus theorists and practitioners agree that monetary policy does not work directly but has its influence through its effects on the financial system on which central bank actions first impinge.

As we have already noted, our understanding of the underlying nature of financial processes has been greatly enriched by the development of portfolio theory by Markowitz, Tobin, Lintner, and others. At the same time, Shaw and Gurley and numerous others have shown how change in the process of intermediation can influence the level and structure of interest rates. These theoretical analyses have stimulated a great deal of empirical work on the portfolio behavior of various types of financial institutions, businesses, and households.

Many of these strands of theoretical and empirical work can be brought together in an econometric model of the financial system. Theoretical work on the behavior of individual households, firms, and financial institutions guides the empirical analysis of the behavior of individual units. The results of that research in turn guide the formation of empirical hypotheses about the aggregate behavior of sectors of the financial system. At the same time, the theoretical models of the whole system control the structure of a model which will reflect the interactions among the sectors.

A great deal of progress in building up the various strands of theoretical and empirical work has been made by the builders of financial models — particularly the Fed-MIT-Penn consortium. Starting with an empirical version of the Keynesian theory of interest rates in which a single interest rate is determined by the supply and demand for money the financial models have been gradually expanded. The supply of money has been made endogenous and in the process a more realistic and complete treatment of the commercial banking system has been introduced into the models. In recognition

of the special characteristics of the mortgage markets, the more recent versions of the Fed-MIT-Penn model include a very elaborate treatment of the mortgage market and the thrift institutions.

Yet much remains to be done. The models presently in use still begin with a Keynesian supply and demand for money approach to interest-rate determination. The multiplicity of existing interest rates then is dealt with by subsidiary equations of the term-structure type — homogenizing the security markets into a single bond market. For Keynes that was a very ingenious simplification and it is useful in empirical models which are meant to be simple and compact. But once we embark on the task of giving a detailed treatment of the structure of the financial system, there is a strong case for building a model which starts from the beginning with a clearing of markets of particular types of securities. The model presented here follows that approach.

The need for a model which deals directly and explicitly with the supply and demand for specific types of securities is also emphasized by the problems which arise in the evaluation of the variety of reform proposals now under discussion. The model presented here has been developed to facilitate the analysis of the effects of a variety of proposed changes similar to the ones sketched out in the previous section. The model deals explicitly with the market-clearing process for a number of different types of financial assets. It is based on the flow-of-funds data and uses a “flow-of-funds” approach but with a considerable consolidation. Of course, flows of funds include not only the disposition of the current surpluses and deficits of spending units but also the shifts of assets and liabilities among sectors arising out of the reallocation of existing portfolios. But to provide meaningful control totals and to emphasize the link between the “real sector” and the financial sector, the model is linked to the national income accounts framework by incorporating NIA surpluses and deficits of the sectors as the basic measure of net claims on the capital market. Finally, the model provides a simplified analytical framework for examining the allocation of credit among potential users.

The reader who is familiar with other financial models will note a number of points at which our model differs from the ones now in use. First, the model is organized in terms of the supply and demand balance for particular types of securities. If financial structure makes a difference, it must do so, we believe, either by affecting interest rates in particular markets or by affecting the extent of credit rationing in those markets. In either case, structural changes will exert their

influence through their effects on the supply or demand for different types of securities. The alternative approach used in some other models is to organize the model in terms of the supply and demand for money and a term and risk structure approach to interest-rate differentials. Other factors can be grafted onto the framework of the term-structure equations where necessary. That approach avoids some of the problems posed by weaknesses in the data base and for certain purposes can be very useful. But for our purposes, it is not satisfactory because it does not show explicitly how structural changes such as those outlined above affect particular markets.

Second, our special interest in short-run cyclical changes has led us to give considerable emphasis to the dynamic effects of short-run changes in the flows of funds arising from the sector surpluses and deficits. In the longer run, the relative stocks of different kinds of assets and liabilities play a dominant role in determining interest rates. But the flows assume relatively greater importance in short-run cyclical changes.

In the following sections of this paper some of the implications which follow from a flow-of-funds analysis of the financial system are examined in greater detail. The distinction between a money-market model and a bond-market model is the topic of the following section. The choice between these two approaches does not involve differences in interpretation of the basic monetary theory. Rather they are different views of the same financial mechanism. The primary issue in choosing between the two approaches hinges upon the extent to which financial assets other than money can be homogenized into one asset, "bonds."

The importance of the distinction between the stocks of financial assets outstanding and their rate of flow through the markets is examined in section three. The general model of portfolio balance is modified in order to include elements which reflect current flows of savings and investment behavioral response lags, and the use of liquid asset stocks as a buffer against unanticipated changes in income and expenditures.

A summary outline of our model of the credit markets is given in section four. The model is based on a consolidation of the Flow-of-Funds as currently published by the Board of Governors of the Federal Reserve System. This section includes a brief description of the major market participants and financial instruments which are treated explicitly in the model. The following section five outlines the general considerations which guided the specification of the individual equations. In section six, several individual sectors which are of special interest are discussed in greater detail. A complete list of all the equations of the model is provided in Appendix B.

The concluding section discusses some illustrative simulation results from the model. Multiplier responses to changes in government expenditures and unborrowed reserves are presented as simplified measures of the implied effectiveness of monetary and fiscal policy. A FNMA purchase of residential mortgages in exchange for increased issues of government securities is examined as illustrative of a policy change which is contained completely within the market for "bonds."

II. MONEY-MARKET MODELS AND BOND-MARKET MODELS

In spite of the great progress in monetary theory made in the past 35 years, financial models are still based on an admittedly simplified theoretical approach developed by Keynes in the *General Theory*. The basic theme of the monetary argument in the *General Theory* is the proposition that — at least in the short run — interest rates are determined by financial factors, not by the underlying forces of productivity and thrift.² To support that point, he developed a simplified and rather ad hoc type of portfolio theory to show that there is a demand for money to hold as a more permanent asset in addition to the traditionally recognized inventory or transactions demand. Further, the amount of money demanded for this "speculative" purpose would, Keynes argued, vary with the level of interest rates, with expectations of future changes in rates, and with the certainty with which they are held. The special form of the argument used by Keynes has long been discarded but in the more general form developed by Tobin, the same conclusions hold. The upshot was to cast money in the role of a diluter of risk — not only the risk of change in bond prices but of any type of risk associated with asset holdings.

In presenting his theory, Keynes emphasized his departure from prior approaches by arguing that the interest rate is determined in such a way as to equate supply and demand for money rather than, as in traditional theory, the level required to equate savings with investment. Keynes' money argument was based on the assumption that only two assets are to be considered — money and bonds. In that case it is equally true that the equilibrium interest rate can be said to clear the market for money and that the same equilibrium

²In the long run, of course, the forces of productivity and thrift emphasized in neo-classical literature must significantly influence, if not uniquely determine, the movement of the real rate of interest while the nominal rate of interest will be moved by expectations of inflation as well as by the forces determining the real rate.

rate clears the market for bonds. Keynes could have expressed his theory in terms of the supply and demand for bonds just as well as in terms of the supply and demand for money. He chose the other route in order to emphasize the difference between his theory and its predecessors.

Since the appearance of the *General Theory* there has been a rapid development of monetary theory which has served to enrich and generalize the Keynesian approach while still leaving its fundamental ideas intact. The theory of liquidity preference has been through the work of Markowitz, Tobin, Lintner, and others — made part of a more general portfolio theory grounded on the general theory of household and firm behavior. The economics of the transaction component has been extensively developed from the inventory theory based provided by Tobin and Baumol. The endogenous elements of money supply have been recognized. Finally, it has been recognized that the “risk dilution” function of money can also be performed by other liquid assets including all kinds of time and savings deposits. The demand for money depends on time deposit rates as well as on the yields of marketable securities. None of these developments pose any real difficulty for the original Keynesian theory. It is more complicated but still usable.

But the original theory can only be used if we are content to combine all the securities into one aggregate called bonds. Then a set of equations for the supply and demand of money will determine “the interest rate” on those bonds. But which interest rate? With some violence to the facts all long securities may be combined and the rate spreads between them explained by risk differentials. Similarly, all short securities can be combined. But the long and short securities cannot be readily combined and rate spreads between them vary greatly. A solution commonly used has been to introduce a theory of term structure in which current long rates are determined by moving averages of past rates. The Keynesian theory can then be applied to determine the current short rate. In effect, term and risk differentials are used to homogenize all the different securities so that they can be treated like Keynes’ “bonds.” This is a formally acceptable solution.

But whether it is an empirically acceptable solution depends upon the empirical acceptability of the hypothesis underlying the “homogenization” of the many different types of marketable securities. If it is not valid then it is necessary to use models which clear the markets for different types of securities explicitly. The formal relations between the two approaches can be clarified by considering a simple model.

This illustration limits the number of financial assets to four: money (M), deposits (D), short-term marketable securities (S), and long-term securities (L). There are three actors: households as net savers (H), a financial intermediary (I), and a security-issuing business sector (B). Net household financial wealth (W_H) and net business debt (W_B) are predetermined by the savings and investment flows of the real sector.³ The three balance sheets can be expressed in equation form as:

$$\begin{array}{ll} (1) W_H = M_H + D_H + S_H + L_H & (4) S_B = S_I + S_H \\ (2) M + D_H = R + S_I + L_I & (5) L_B = L_I + L_H \\ (3) W_B + M_B = S_B + L_B & (6) M = M_H + M_B \end{array}$$

The exogenous variables of the system are W_B and bank reserves, R. Household wealth (W_H) is, of course, identically equal to the sum of those two items. The system contains four supply and demand markets but only three rates, deposits, short-term securities and long-term securities since the yield on money is zero. Because of the balance sheet constraint each sector can have at most three independent demand (or supply) equations – the sector's fourth demand (or supply) equation being deducible from the other three and the balance sheet constraint. That consideration makes it possible to analyze a set of equations containing a given set of propositions about sector portfolio behavior in a number of different ways. In the present case the straightforward approach would be to start with explicit equations for the demand and supply of long and short securities. Thus we could write:

$$\begin{array}{l} (1) S_H = F_{SH}(r_S, r_L, r_D) (W_B + R) \\ (2) L_H = F_{LH}(r_S, r_L, r_D) (W_B + R) \\ (3) D_H = F_{DH}(r_S, r_L, r_D) (W_B + R) \\ (4) S_B = F_{SB}(r_S, r_L) W_B \\ (5) L_B = F_{LB}(r_S, r_L) W_B \\ (6) L_I = F_{LI}(r_S, r_L, r_H, R) \\ (7) L_I = F_{LI}(r_S, r_L, r_H, R) \\ (8) r_D = F(r_S, r_L) \end{array}$$

³This illustration ignores the redistributive effect of capital gains and losses on outstanding securities.

Substituting equation 8 into equations 1 through 3 and substituting the resulting 3A into 6 and 7, we obtain a set of equations for household and bank demand for long and short securities. Adding these and equating to the corresponding business supply equations, we obtain the equilibrium long and short rates. Substitution back into the quantity equation yields the equilibrium quantities of securities, deposits, and money. In this approach no use is made of the demand for money equations; and the supply of money is obtained by determination of bank assets, time deposit liabilities, and use of the bank balance sheet identity.

Without changing the substance of the solution in any way, it would also be possible to eliminate the equations for short securities and replace them by introducing the money demand (supply) equations. Such a substitution would have no substantive significance since the new equations would contain exactly the same information as the other set. However, the possibility of suppressing some security market equations and replacing them with money market equations leads directly to the further consolidation of the whole system into a one-bond market model.

Suppose we accept a strong term structure hypothesis of the form $r_L = \sum_{i=0}^{\infty} a_i r_{t-i}$. The hypothesis implies that for some substantial number of market participants long and short securities are perfect substitutes. The net demand curve for long-term bonds will have a flat range at $r_L = \sum a_i r_{st-i}$. The number (weighted by wealth) of participants who regard long and short securities as perfect substitutes must be large enough to insure that the net demand curve will cross zero in the flat range.

In that case, since long and short securities are effectively perfect substitutes, they may be aggregated. After appropriate substitutions to eliminate deposits from the system we are left with a model in which we have a supply equation and a demand equation for bonds. On equating these, we obtain the equilibrium short rate. We can then substitute back to determine the long rate, the deposit rate, and the other quantities in the system. In this procedure, of course, the money supply and demand functions are reduced out.

Alternatively we can drop the bond equation and obtain the short rate directly from the money demand equation (after making the term structure substitutions to eliminate the long rate). These substitutions will, of course, make the money demand (supply) functions reflect the perfect substitutability of the long and short bonds. The latter procedure is the one implicitly used in models which use a supply and demand for money plus term-structure approach.

In summary three types of models can be distinguished: (1) a pure securities market model in which the demand and supply for money equations are dropped; (2) an intermediate model which uses a supply and demand for money equation in place of the corresponding equation for short securities but retains explicit treatment of other security markets; and (3) a money-market model which closes the market for money explicitly but homogenizes all securities by term- and risk-structure equations.⁴

The choice between the first two does not depend on issues concerning substantive hypotheses. An explicit short securities market approach enables the model builder to use more information and to determine in more detail the interaction between markets — particularly short security markets and time and savings deposit markets — but uses a data base which is somewhat weaker in the aggregate than the money market alternative. Accordingly to the purpose for which the model is to be used, a case can be made for either alternative.

More fundamental issues are at stake in the choice between either of the first two alternatives and the third. As noted earlier, the validity of the pure money-market model depends upon the validity of the homogenization process which permits the use of Keynes' money versus bonds approach. In effect, the homogenization process assumes that relative yields on different types of securities are independent of the relative quantities of those securities outstanding. That proposition has been debated intermittently for many years in connection with debates over the term structure of interest rates; but the same considerations which enter into the term structure argument apply in the case of different types of securities of the same maturity — corporate bonds versus tax — exempt securities and mortgages, or different grades of bonds.

It is not necessary to repeat here all the argumentation of the term-structure dispute, but it is worth noting that the "expectation" approach to the theory of term structure appears to be inconsistent with the implications of the portfolio-balance theory. In principle at least the relative quantities of the different types of securities which have to be absorbed by the market participants should make a difference. At the same time, it is also true that expectations of future rates should exert an important influence on current rates. It is an empirical question therefore whether one or the other of these forces plays a dominant role or whether both play a significant role in the

⁴In principle one can also construct a model using the money demand equation and the short security equation. But since in practice there are several distinct long markets, the implicit treatment of these would have little analytical value or convenience.

rate determination. But the models which implicitly homogenized all marketable securities in order to determine the "interest rate" by equating the supply and demand for money are valid if and only if the expectations factor dominates all other factors in the term structure, and if and only if an analogous treatment of risk differentials applies to different securities of the same maturity.

Beyond those general considerations a number of specific institutional considerations suggests the importance of designing financial models which treat explicitly the market clearing processes for a number of different types of securities. The notion that all securities can be homogenized so that it makes no difference whether a given wealth total consists of long or short government debt, equities, corporate bonds, business or consumer bank debt, or municipal bonds seems inconsistent with the well-known specialization of institutional demand. Thrift institutions specialize in mortgages, insurance companies in corporate bonds, banks in business loans and municipal bonds. Competition between institutions as well as marginal shifts in the composition of their portfolios do serve to link up the different markets. But to say that the markets for different types of securities are not water-tight compartments is not to say that securities can be treated as completely homogenous or that factors making for portfolio specialization can be ignored.

Our model, therefore, is one which includes a number of separate but closely related markets. In each case we have tried to identify supply and demand factors separately. To the extent that two types of securities are very close substitutes in some portfolios, this should show up in the coefficients on the rate differential in the demand functions. Similarly, expectational variables are included; and, if they play a dominant role, they will be reflected in the equations. Thus, the homogeneity of different types of securities can assert itself if it is there, but it is not assumed in advance. On the other hand, if institutional factors are relevant, it will be possible to see what role they play and to make a reasonable assessment of the effects of institutional change.

III. STOCKS AND FLOWS

The foundation of modern financial analysis is the theory of portfolio balance. Most portfolio theorists agree that the households and firms (financial and nonfinancial) with whom we are concerned are ultimately interested in the composition of their total portfolio of assets and liabilities. The purchases and sales of assets which generate

“flows of funds” are only means to the end of achieving optimal portfolios. The flows of asset transactions are not (except to brokers) ends in themselves. Any model of financial behavior must be based upon the theory, or a theory, of portfolio optimization for the actors in the system. Our model is no exception to that rule. All of our sector demand equations contain terms which are intended to reflect long-run shifts in the allocation of wealth in response to changes in relative yields of assets.

However, we have found it necessary to include elements reflecting the current flows of savings and investments to a greater extent than one might expect from the overwhelming emphasis on the relative stocks of assets and liabilities in the theoretical literature. Indeed, we have arranged the model so as to use the sector savings and investment balances as control totals. Since saving necessarily equals investment *ex post*, the total volume of savings and investment is not of great significance but for reasons given below, short-run shifts in the sectoral balances of savings and investment can cause significant disturbances in financial markets and relative interest rates. The current flow elements in the system become significant because of the presence of what used to be called frictions in the system, i.e., from transactions costs, and information collection and processing costs not recognized in the pure static theory of portfolio balance.

In a frictionless world in which all portfolios are kept continuously in equilibrium, flows of savings and investment appear in the determination of interest rates only in very indirect ways. The interest rates and asset prices are determined at every moment by the relative stocks of assets, the risk return preferences of households and firms (financial and nonfinancial), and the institutional factors which influence the operations of intermediaries. Of course, the relative stock of money or bank reserves is one of the important determinants of the outcome. In addition, savings and investment flows can be regarded as instantaneous rates of growth of asset stocks and thus their cumulative values influence the movement of asset prices and yields over time. But given the stocks of assets at time T , the rates of savings and investments at that moment do not influence directly the asset prices and yields. Savings and investment decisions may influence the outcome through their influence on income and thereby on the income streams generated by assets and through the resulting changes and transactions demand for money or the increase in the value of equities relative to fixed income assets. But a poor investment outlook and a low propensity to save can generate the

same income as a strong investment outlook and a high propensity to save. At any given moment, the income effect counts, the rates of accumulation do not (though in the long run different rates of asset accumulation will matter).

That proposition was in the center of Keynes' argument though he did not, of course, make much reference to the growth aspect of his analysis since he was interested in a very short-run analysis.

In his model of interest-rate determination saving and investment appear only through the influence of the position of the MEC schedule and the propensity of save on income and thereby on the transactions demand for money.⁵ That treatment of the role of savings and investment appeared startling at the time and produced a rapid flow (cumulating to a large stock) of literature on liquidity preference versus loanable funds. After several rounds, it appears that Keynes finally agreed that variations in savings and investment flows might cause some transitory frictions which he regarded as relatively unimportant.

In fact, however, in his anxiety to overturn the traditional interest-rate analysis, which turned on the role of the interest rate in equating savings and investment flows, Keynes went too far in de-emphasizing the significance of the disturbances created by short-run variations in sector savings and investment balances. The fact that the disturbances have no effect in a frictionless world does not entitle us to ignore this effect in the real world — particularly when we are concerned with short-run cyclical phenomena.

In addition, most portfolio theorists agree that wealth holders respond only gradually to changes in asset yields which change the optimal allocation of their portfolio. The response lag is usually attributed to the transactions costs, and the costs of obtaining information. In portfolio equations, it is usually assumed that portfolio holders act to eliminate, in each time period, some fraction of the discrepancy between their actual portfolio and the optimal portfolio for the current asset yields.

The adjustment lags have the effect, of course, of reducing the short-run elasticity of demand for any asset (with respect to asset-yield differentials) to a fraction of its long-run value. Conversely, the amount of a given change in yield differentials required for short-period adjustment to a change in the composition of wealth is greatly magnified by portfolio adjustment lags. That consideration is in itself sufficient to justify our greater concern with short-period changes in

⁵The wealth effects of income and interest-rate changes could have been incorporated into the model without much difficulty but Keynes neglected these.

the composition of savings and investment flows than would be warranted in a frictionless world. However, that general argument is greatly strengthened by some more specific aspects of our financial markets and institutions.

The balance between the flows and receipts of expenditures for individual households and firms is constantly shifting for a variety of reasons. Some of these shifts are anticipated by the households or firms in question, others are surprises — pleasant and otherwise. In either case most households and firms expect frequent shifts from a net inflow of funds to a net outflow and back again. The literature on the transactions demand for money shows that rational spending units will find it economical to hold an average cash balance — sacrificing interest income — in order to avoid the transactions costs of shifting in and out of income-yielding assets to adjust to surpluses and deficits arising from its nonfinancial operations.

Precisely analogous argument shows that it pays to hold an average balance in non-money liquid assets, e.g., time and savings deposits and short-term marketable securities. The optimum amount and composition of such balances will depend on the transactions costs for acquisitions and withdrawals from various kinds of assets, on the scale of operation of the spending unit and on the variability of its surpluses and deficits. For businesses a rather similar argument applies on the liability side to the choice between financing deficits by issuance of long-term securities or by bank borrowing and commercial paper.

Because of these transactions considerations, any portfolio model will reflect the fact that households will hold more liquid assets in their portfolios (at any given set of interest rates) than would be the case if liquid assets were held only for risk dilution purpose.

These considerations apply to the average amounts or proportions of liquid assets and short-term debts in portfolios. But to the extent that liquid assets and liabilities are actually used to *buffer* short-run movements in the surplus or deficit (on nonfinancial accounts) of households and firms, changes in those surpluses and deficits will be reflected in the rate of flow of funds into and out of various types of liquid assets. Many of these shifts cancel out within sectors but cyclical changes in nonfinancial activity are reflected in intersectoral shifts in the composition of surpluses and deficits. Different sectors buffer these shifts in their financial position in different ways. Consequently short-run changes in surpluses and deficits are reflected in changes in the flows of funds into and out of different financial markets. Our model indicates that changes in the savings of house-

holds are reflected initially in nearly equivalent changes in the flow of funds into currency and various kinds of deposits.⁶ Nonfinancial corporations adjust to short-run flows through sales of liquid assets, bank borrowing, and commercial paper issues. Banks in turn adjust to an imbalance between loan demand and the inflow from demand deposits and consumer time deposits by the sale of liquid assets, variations in free reserves, and more aggressive placement of negotiable CDs. The Federal government — a big swinger in the surplus and deficit world — tends to adjust its position largely through short security issues.

In the short run therefore the composition of surpluses and deficits among the different sectors of the economy can have considerable influence on short-term interest rates and on the flow of funds through the different types of financial intermediaries. This, in turn, has significant implications for the markets for mortgages and municipal securities. Over somewhat longer periods the cumulative composition of surpluses and deficits among the sectors can have significant influence on the term structure of interest rates because of the low (or moderate) run elasticities implied by the stock adjustment process. Our model is keyed to the sector surpluses and deficits in order to bring out these effects as clearly as possible.

IV. THE STRUCTURE OF THE FINANCIAL MODEL

Unlike most existing models of the financial process, the present model reflects a primary concern with the savings-investment function of the financial system. Thus, it begins with the sector surpluses and deficits of the national income accounts. The model itself can be viewed as an elaboration of this basic savings and investment accounting identity. In the absence of valuation problems, these income flows are measures of the net increment to financial assets and liabilities for each individual sector. The treatment of these sector surpluses or deficits implies that the underlying income and investment flows are predetermined for purposes of this financial sector model.

They are, of course, endogenous elements of a complete income-expenditure model. We are mainly concerned here with the financial system but in order to conduct simulation experiments which take account of the mutual feedbacks between the financial system and

⁶If the flows are not quickly reversed, the resulting portfolio imbalance is gradually eliminated by a stock adjustment process which shifts households into other asset forms.

the income-expenditure system, we have constructed an aggregate-demand model. Although it is, by today's standards, a relatively compact model (85 equations), it follows the outlines of the widely known large-scale models. The model includes expenditure equations for all the sectors whose surpluses and deficits appear in the financial model. It also, of course, provides equations which determine the intersectoral distribution of income. Finally, it contains 25 equations for determination of wage and price-level changes. Because the aggregate-demand model contains no important new wrinkles, we shall not discuss it in detail here but turn at once to the structure of the financial model.

The savings-investment identity which provides the basic organizational framework of the financial model is shown in equation (1). Five major sectors are recognized and the classification of each as a deficit or surplus sector is simply one of expositional ease. The deficits of business, Federal Government, state and local governments, and the foreign sector are equivalent to household savings plus the statistical discrepancy.

$$(1) \text{DEFB} + \text{DEFGF} + \text{DEFGSL} + \text{DEFFOR} - \text{SURH} - \text{STAT} = 0$$

The definition of each sector's deficit in terms of National Income Account items is shown in Table 1. There are some minor divergencies from the accounts which are spelled out at the bottom of the table. The most important of these is the division of residential construction and capital consumption allowances between business and households, and the inclusion of foreign direct investment and profit repayments as nonfinancial flows of the business sector. As a result of this method of relating the financial and real sectors, the present model of the financial sector is fully consistent in its basic approach to most existing income-expenditure models and analytical results can be carried over from one to the other.

In its treatment of financial assets and liabilities, the model follows the general structure of the Flow-of-Funds Accounts. However, the present structure of the accounts is too large and complex to provide a useful summary framework for examining the allocation of credit. Without aggregation any financial model quickly founders in a sea of different assets and institutions. The present model reflects our attempts to obtain a strategic simplification of the credit markets; and it is intended to be illustrative of an underlying framework for evaluating a wide range of different issues.

TABLE I
SOURCES AND USES OF FUNDS BY SECTOR
(LINKING THE REAL AND FINANCIAL SECTORS)

Business Sector Deficit		30.4
Gross domestic investment ¹	117.5	
Direct foreign investment ²	3.6	
less: Retained earnings	15.4	
Foreign branch profits ²	2.3	
Inventory valuation adjustment	-4.4	
Capital consumption allowances ¹	77.4	
 Federal Government Deficit		 12.9
Total expenditures	204.5	
less: Total revenue	191.6	
 State and Local Deficit³		 3.9
Total expenditures	132.1	
Retirement credit to households	6.8	
less: Total revenue	135.0	
 Foreign Deficit		 -0.9
Exports	62.9	
Foreign branch profits ²	2.3	
less: Imports	59.3	
Transfers from U.S.	3.2	
Direct foreign investment	3.6	
 Household Surplus⁴		 51.0
Disposable income	689.5	
Retirement credit from S & L governments	6.8	
Capital consumption allowances	9.0	
less: Personal outlays	634.7	
Residential home purchases	19.6	
 Statistical Discrepancy (NIA)		 -4.7

¹Excludes component of residential investment and depreciation attributed to household sector.

²Included herein but not in NIA definitions.

³Differs from NIA definitions by inclusion of pension fund payments to established funds as an expenditure.

⁴See footnotes (1) and (3).

Sources: Tables 4, 6, 10, 12, 13, and 14 of National Income and Product tables, *Survey of Current Business*, April, 1972; and Table 1 of Flow of Funds, 4th Quarter 1971.

Asset Categories

The model differentiates among four major categories of financial assets: deposit accounts, negotiated loans, liquid marketable securities, and income-yielding long-term market assets.

Deposits Accounts include demand and time deposits at commercial banks, saving and loan shares, savings bank deposits, and life insurance company reserves. Their most distinguishing characteristics as an asset are a high degree of liquidity and the absence of any risk of capital gains and losses. The yields on these assets, while competitive in the long run, display far less cyclical variation than yields on marketable securities. Second, they represent the major portion of the liabilities of those financial intermediaries whose investment policies differ substantially from those of their depositors. Thus, for example, the allocation of household assets between deposit accounts and other instruments will be shown to be of primary importance to the mortgage market.

Negotiated loans include consumer credit, residential mortgages, and bank loans to business. These instruments are characterized by very limited liquidity because of the absence of a developed resale market. They are dominated by the institutions on the lending side; and the equilibrating of demand and supply in the short run is heavily influenced by nonrate factors such as credit rationing, institutional rigidities, and government regulations. Negotiated loans are not in most cases general-purpose financial instruments; and the portfolio selection model, used for other assets and liabilities, is frequently inappropriate for both demand and supply.

Liquid Marketable Securities include short-term U.S. government securities, commercial paper, and short-term state and local debt.⁷ These assets are characterized by very substantial short-run variations in the volume outstanding and in their distribution among types of

⁷The definition of liquid U.S. government securities is somewhat unconventional in that it includes all agency issues and marketable debt under five years. The five-year cutoff was used instead of one year because of a substantial volume of transactions in securities in excess of one year. The intermediate-term securities also are held in substantial volume by sectors such as business which we would normally expect to have primarily a liquidity interest in financial assets. These factors implied that the one- to five-year securities are viewed as a highly-liquid investment. There is also a statistical problem of sharply defining the cutoff at one year. With so much movement between one year and over within individual sectors, it was virtually impossible to estimate a stable demand function that could distinguish between a one- and a two-year security. The series actually includes all securities under four years and a linearly declining proportion of those from four to six years. The procedure was followed in an attempt to eliminate the sudden shifts in the data resulting from the simple aging by which a long-term security on one day suddenly becomes a short-term security on the next.

holders, and together with deposits provide the major source of liquidity. Since liquid assets are useful primarily as a buffer against unanticipated future payments, the pattern of such holdings will be heavily influenced by short-run flow disturbances.

The category of income-yielding *long-term financial assets* includes U.S. bonds, corporate bonds and stocks, commercial mortgages, and state and local bonds. Unlike negotiated loans, these securities are frequently traded in impersonal competitive markets. On average, they provide a yield substantially above that of liquid assets, but only at the risk of substantial short-run capital gains and losses. The decision to hold such securities is dominated by income considerations of relative yield and risk.

Although these securities can be distinguished on the supply side by issuing sector, they are highly substitutable for each other from the viewpoint of the marginal purchaser. As a result, the observed market-clearing rates are highly colinear with each other and it is difficult to estimate stable demand functions. In general, because of this high degree of substitution, we find a limited economic interest in the composition of these asset holdings by an individual investor class. However, at some stages in the model it is of interest to separate out one or more of these assets (e.g., municipal bonds) for special treatment.

The above classification does leave a residual category of financial assets. The residual group combines a large number of relatively minor items, the most significant of which are trade credit, unallocated assets, and the statistical discrepancies between the National Income Accounts' measures of sector deficits or surpluses and those of the Flow-of-Funds Accounts. These assets are characterized by the lack of a measured market-clearing price which could be used to estimate market demand and supply functions.

In the introductory section, we indicated that the lack of a homogenous security market provided a primary rationale for examining the behavior of the bond market rather than simply the demand and supply of money balances. The above asset classification is intended to reflect the major areas among which the lack of homogeneity is of greatest interest. The usual portfolio selection model of financial analysis is most appropriate in the market for long-term marketable securities when relative yield and risk are of primary concern. The demand for liquid marketable securities, however, is heavily influenced by the magnitude of actual and anticipated variations in receipts and expenditures. Deposit accounts are of special interest because of the restricted nature of the investment

decision of the financial intermediaries. The negotiated-loan markets are deserving of special treatment because of the importance of credit rationing, regulations, and institutional market practices.

Financial Market Participants

In addition to the five categories of ultimate savers and investors discussed earlier, the model has been expanded to include the activities of four financial intermediaries: commercial banks, savings and loan associations, savings banks, and life insurance companies. The model could obviously be enlarged to include others such as pension funds, other insurance, or credit unions. However, at present these institutions either are not large enough to affect seriously the model or have asset structures similar enough to those of the holders of their liabilities so as not to seriously influence the performance of the model.

The four financial intermediaries that are identified specifically are of particular importance in the markets for negotiated loans. For example, they account for over 80 percent of residential mortgage loans, and commercial banks dominate the markets for short-term business and consumer loans. These intermediaries also are strongly influenced by Federal regulations on portfolio composition, both assets and liabilities, and restrictions on offered interest rates. The regulations governing commercial-bank behavior are a major element of the mechanism by which monetary policy changes are transmitted throughout the financial system.

The resulting financial model is composed of a set of demand and supply equations for each of the major asset categories disaggregated among five nonfinancial sectors and four financial institutions. Since not every sector is active in each market and because they usually appear only as a supplier or demander of funds, the actual number of equations is substantially less than the number of cells implied by the full matrix of financial assets and participants.

V. BEHAVIOR OF INDIVIDUAL ECONOMIC UNITS

An individual economic unit must make a large number of choices in adjusting its balance sheet to changes in net worth, interest rates, investment opportunities, and other factors. This decision process is too complex to be fully considered within a small statistical model, which is to be applied to aggregate time-series data. In order to obtain useful results within the confines of the available data, some

simplifying assumptions must be made in order to focus on those aspects of major economic interest. We have followed a practice of grouping alternatives into broad sets of similar choices which are viewed as part of a recursive decision-making process of moving from the large to the small. For example, the individual consumer is viewed as making an initial allocation of his current wealth between current consumption, investment in physical assets, and investment in financial assets. The allocation among alternative choices within these major groups is viewed as a subsequent stage of the decision process. Our primary concern is with the secondary step of allocating net financial wealth among alternative financial assets and liabilities. But here, too, the approach remains quite aggregative.

The Determinants of Desired Stocks

The formulation of the demand for and supply of individual financial assets or set of financial assets draws heavily on the model of portfolio selection developed by Markowitz, Tobin, and others. According to this view, the demand for a specific financial asset is a demand for a desired *stock* of the asset in question rather than a flow rate of purchase. Thus, the demand of an individual investor is constrained by his net financial wealth.⁸

Individual assets and classes of assets are distinguished on the basis of relative yields, risks, and liquidity. The demand functions of individual actors in the financial markets differ in terms of the amount and composition of their real wealth, their "tastes" with respect to yield, risk, and liquidity, and in some cases legal constraints (e.g., the reserve identity for commercial banks, portfolio restrictions on savings and loan associations).

A direct measure is available only for the yield aspect of most assets. Since this is the current market rate, it is not the expected yield actually called for. This shortcoming is particularly important for long-term marketable securities where the capital gain or loss component may be a major part of the yield.

But the data problem is even more severe for risk and liquidity where no direct measures are available. In cross-sectional analysis, where the emphasis is on explaining why asset structures of individual investor portfolios differ, the standard deviation of observed

⁸In these works, the mean and standard deviation of a subjectively determined probability distribution are used to measure the yield and risk associated with a financial asset. This simplification provides strong conclusions with regard to the pattern of optimal portfolio selection, in particular that the overall utility of the portfolio will be increased by diversification.

yields is a frequently used measure of risk. But risk is a difficult concept to quantify within a time-series model. The problem is complicated by the need to distinguish changes in relative rather than overall risk.

The present model incorporates risk and liquidity primarily as constant characteristics of an asset. Thus, they served as major criteria in the classification of individual assets and liabilities among different categories such as deposit accounts, liquid marketable securities, and long-term assets. Investor "tastes" for risk and liquidity then are implicitly reflected in the functions determining the behavior of these groups. Since a concept similar to the interest rate is not available to measure the return or benefits derived from liquidity or low risk, they may also be represented by the ratio of existing liquid (or risky) asset holdings relative to net wealth. To the extent that assets can be classified into categories of liquidity and risk, these compositional variables (e.g., the ratio of liquid assets to net worth) may reflect implicit costs and benefits to the investor of risk and liquidity. This implicit return aspect is a major behavioral rationale for the inclusion of existing stocks of other asset groups in the individual asset-demand equations.

Short-Run Adjustments

While the factors of relative yield, risk, and liquidity may provide an adequate explanation for long-run patterns of portfolio composition, they are but part of the explanation of short-run market patterns. First, investors cannot be expected to adjust their actual stocks instantaneously. Investor inertia, transactions costs, and uncertainty are all contributing factors. In addition, many securities do not have ready resale markets and a complete adjustment must await the maturing of existing claims. Legal regulations may also hamper the adjustment process. Examples of this type are ceiling limits on deposit rates and restrictions of either a maximum or minimum nature on the proportion of an institution's portfolio which may be represented by a specific asset. These elements at times may impart an element of discontinuity to individual demand and supply curves.

Second, the long-run stock analysis must be modified to allow for numerous short-term flow disturbances. In particular, liquid asset positions are dominated by unanticipated fluctuations in the real income flows against which they are designed to provide a buffer. Cyclical changes in retained earnings, inventory investment, and unpaid tax liabilities are some of the more obvious examples within the

business sector. The financial intermediaries are also faced with unanticipated changes in deposits and loan demand which must be matched by compensatory changes in other assets or liabilities.

Summary Form of the Typical Equation

In summary, the basic behavioral assumption that underlies the individual equation is one of portfolio selection whereby the individual actor tries to align the distribution of the stocks of financial assets within his portfolio in response to relative yields. The response to changes in wealth and yields is specified to occur with a partial lagged adjustment. In addition, the actual short-run adjustment pattern is distorted by changes in nonfinancial flows.

These behavioral assumptions can be stated in equation form as follows: The desired stock of each asset or liquidity is assumed to depend upon a vector of interest rates, r ; a wealth constraint, W ; and other factors, X (e.g., income or transactions requirements),

$$A_i^* = a_i + \sum_j b_{ij} (r_j W) + c_i W + \sum_k d_{ik} \cdot X_k .$$

The interest-rate terms are scaled by the net-worth constraint and all of the equations are estimated in linear form. In those situations where liquidity is an important consideration, the ratio of liquid assets to wealth is included as a measure of the implicit yield on such assets. Because net worth is used as a scale parameter, it appears several times in the equation and its net influence should not be obtained by reference to the c_i coefficient alone. The total wealth effect can only be deduced for specific fixed values of the interest-rate terms. Where significant, a trend term is included as proxy for other secular factors not specified in the equation. This prevents such influences from being attributed to the interest rates which have a strong trend component.

The short-run stock adjustment process is generalized somewhat to include the lagged stocks of other assets and various flow disturbance terms, Z .

$$\Delta A_i = \sum_j \lambda_{ij} [A_j^* - A_{j-1}] + \tau_k \cdot Z$$

In addition, the asset equations for each sector are given a common

structure to the extent feasible. This reduces the sensitivity of the equation results to the choice of which asset to treat as a residual.

However, the equation form does vary substantially among the various sectors in response to different structural restrictions upon the actors. In individual situations, various symmetry conditions of rate response have been imposed by prior restrictions. Variables were also excluded from the final equation when their coefficients were both small and insignificant.

Balance-Sheet Restrictions

The overall formulation of desired stocks and the adjustment to discrepancies between actual and desired stocks is sharply constrained by the need to maintain income- and balance-sheet restrictions at all points in time. Within a fixed net wealth constraint, an increase in the holdings of one financial asset must be matched by a corresponding decline in others or by an increase in liabilities. Compositional responses to changes in a specific interest rate or non-rate factor must sum to zero over the whole portfolio. This implies, at the extreme, that each individual demand equation must include the entire list of variables contained in the equations for competing assets. An alternative statement of the same point is that within a portfolio of n assets there can be only $n-1$ independent demand equations, since the equation for the final asset can be deduced by subtraction.⁹

There are several alternative approaches to the estimation of equations within the balance-sheet restriction. The first involves the estimation of $n-1$ independent equations. The equation for the n th asset is then implied as a residual. As a result, the residual-equations structure may be sharply distorted. For example, the cross-effects of interest-rate terms may be quite diffuse so that they are statistically insignificant in equations for competing assets. The elimination of such terms, however, implicitly assigns all of the cross-effect to the residual asset, since the sum of the coefficients must equal zero. The same is true of the adjustment process whereby the assets' own lagged stock is included. Perfect symmetry would require its inclusion in the other equations. Thus each equation in the set of $n-1$ must include the same set of right-hand variables.

⁹A far more detailed discussion of the importance of balance sheet restrictions and other constraints appears in W. Brainard and J. Tobin, "Pitfalls in Financial Model Building", *American Economic Review* (Papers and Proceedings), 58 May 1968, pp. 99-122. Of course, these problems are not unique to models of the financial sector, but they are more obvious in areas where compositional factors are so important.

The problem with the above approach is that it leads to a rapid proliferation in the number of coefficients to be estimated. With limited data the result is multicollinearity, a high risk of spurious correlations, and highly inefficient estimates. Alternatively, equations may be formulated in a very simple context, reducing the number of coefficients to be estimated, but ignoring the complexities of the decision process that are frequently important.

A second approach involves the estimation of the entire set of n equations in a simultaneous-estimation procedure which incorporates all of the balance-sheet restrictions. This is obviously the preferred method of estimation when one is certain that the original specification is correct. But the combination of a large number of independent variables and probable errors in specification can wreak havoc with the estimates. A specification error in one subset of the equations will distort the results for all. It is difficult to evaluate individual equations since coefficient standard errors are not available. In addition, the quality of the original data frequently does not justify an approach which gives so much freedom to the estimation technique in allocating rate effects.¹⁰

At this stage of the analysis we did not feel that our equation specifications justified the use of the second method. We have followed a more eclectic approach of estimating the equations on an individual basis. Variables are frequently not carried over from equation to equation if they were not significant at a reasonable probability level.

An attempt was made to limit the number of independent variables in an individual equation to those of dominant importance. Simplifying assumptions not fully justified by theory were sometimes made if they reduced other problems (e.g. multicollinearity, spurious correlations, and autocorrelation). The procedure of limiting the disaggregation to major asset categories frequently reduced the number of required variables and simplified the equation structure.

In particular, the lagged stocks of all other assets were not always included in the individual equations. Since total net worth usually does appear, their absence only implies the lack of differential effects on the asset in question. For example, the absence of lagged time deposits in an equation for savings and loan shares only implies that

¹⁰Problems of aggregation and measurement error result in situations when the statistical discrepancy is the major balancing item. In computing the least-squares regression, deviations from the mean are treated equally for all asset classes despite the fact that the data may vary in quality.

their influence is no different from that of other deposits or market securities, or that the difference is not of major statistical importance. Frequently, a check was made to insure that the implicit structure of the residual-asset category was not substantially different from that implied by a direct estimate. Thus, the implied structure of the residual equation influenced but did not constrain the estimates of the other equations. We readily confess that the equations are not reality but only illustrative of some of the major forces.

Market Clearing

In principle the procedure outlined above should lead to a system consisting of demand or supply equations for every sector (and financial intermediary) and every asset type. (Of course there would be some blanks since some assets do not appear at all in the balance sheets of some sectors.) In a theoretical model with no residual category, no error terms, and no rationing, net supply of each asset could be set equal to zero. The simultaneous solution of the whole set of equations would then produce the set of equilibrium interest rates. The model proceeds along that line but does not follow it to the end. Most of our equations are in fact supply and demand equations for assets and liabilities, sector by sector. But for a number of reasons we have taken a somewhat different approach to market clearing.

In each market the supply or demand equation for one sector has been omitted and a rate equation fitted instead. If the conditions mentioned above were satisfied, this would simply amount to re-writing the missing equation with the rate instead of the quantity on the left-hand side. For example, there is no equation for the supply of bank loans to business. There is an equation for the demand for bank loans and an equation for the bank lending rate containing the quantity of bank loans on the right-hand side. The solution of the two equations (for given values of the other variables) may be regarded as market clearing through the equating of supply and demand. In fact, for a variety of reasons the rate equations are not strictly simple demand or supply equations solved for the rate. In particular, the mortgage-market equations are organized in such a way as to permit some short-run rationing and a corresponding short-run disequilibrium in the rate. In the case of the bond markets, the household demand for bond equations are replaced by rate equations but the included equations have to be regarded as reduced forms from the solution of a larger system, because the yield on equities cannot be used.

VI. SPECIAL FEATURES OF THE MODEL

The authors have spent several years in building this model so to us everything about it is special, but the financial-model buff will soon recognize that many of the equations are essentially old stuff — differing in detail but not in essence from the treatment of corresponding sectors in other models. In three areas — commercial banking, the bond markets, and the mortgage market — we have departed from standard practice to an extent warranting special notice even in a short outline of the model.

Commercial Banking

In spite of the rapid growth of other financial institutions, commercial banks remain at the heart of our financial system. They hold a wider range of assets than any other class of institutions and deal on the deposit side with all sectors of the economy. Because the business sector uses variations in bank borrowing to buffer short-term fluctuations in surpluses and deficits, banks transmit the effects of short-term changes in business financing needs to the rest of the market. At the same time Federal Reserve open-market operations are directly reflected in bank reserve positions, and it is the banking system's response to changes in reserve positions which links Federal Reserve action to the rest of the market.

Our model of the commercial banking system differs fundamentally from others in the nature of the output. The 17 equations devoted to the commercial banking system do not explain the money supply. Instead they represent — when taken together — the banking system's demand for various kinds of assets. By adding equations from other sectors one can deduce the determinants of the money supply but only as a memo item. Banks enter into the model directly as demanders of assets — business loans, long- and short-term Federal securities, municipal bonds, etc. and as suppliers of such liabilities as negotiable certificates of deposit.

Second, in determining the actions of banks we have placed great weight on the tension between the demand for business loans and what might be called the passive supply of funds — the supply resulting from increases in unborrowed reserves, and time deposits (without a change in rates). This excess loan demand equation (F-7 in Appendix B) brings together the two driving forces mentioned above — business loan demand and open-market policy. Though subject to many qualifications, we have accepted the hypothesis that, primarily

for reasons of long-term profit maximization, banks will attempt to accommodate the bulk of the fluctuations in their business customers' demand for loans.

Rates will be adjusted to reflect the marginal cost of funds and the competitive position as reflected in the amount of excess loan demand. There may also be marginal rationing. But for the most part, if a customer is willing to pay the rate (including, of course, such competitively determined adjustments elsewhere in the portfolio. Those adjustments include sales — or reductions in purchases — of securities, increases in rates for consumer time deposits, CDs, Euro-dollars, or increased borrowing from the Federal Reserve. The equations for bank deposit rates and for assets other than business loans are strongly influenced by the excess loan demand variable. To put it shortly — and with some lack of precision — when the Federal Reserve provides banks with sufficient reserves to accommodate business loan demand passively, the rest of the market is insulated. When Federal Reserve policy does not provide enough reserves, the excess loan demand is passed to the rest of the market through bank sales of securities or bank issues of additional short-term liabilities.

An important variable in determination of money-supply bank assets (and at times a variable used rightly or wrongly as a target by the Federal Reserve System) is the level of free reserves. Our treatment of free reserves starts with a fairly standard stock adjustment mechanism in which the desired level of excess reserves (scaled to adjust for demand deposit reserve ratios) is a function of the bill rate; and the change in free reserves is a fraction of the gap between the target and the previous period's actual reserves. Adding the lagged stock to both sides makes actual free reserves positively related to bill rates, the scale of demand deposits, and positively related to the last period's actual free reserves. This is a fairly standard approach but it neglects important dynamic elements. We find statistically, and we believe that we are in accord with other evidence, that the *level* of free reserves is strongly influenced by changes in excess loan demand.

We have reflected Federal Reserve pressure to limit member bank borrowing by introducing a variable which is zero when free reserves are positive (for the system), but has a negative value when system free reserves are negative. Disregarding the rest of the equation for the moment and considering only member bank borrowing, the equation suggests that a one-time blip from zero to a positive value of excess loan demand will cause banks to borrow. In the following period about 60 percent of the borrowing will be repaid and so long as excess loan demand remains zero the borrowing will fade away in

ensuing quarters. While the coefficients may give excessive precision to the time path, the general idea appears to be consistent with discount window policy and bank appreciation of it. It will be noted that in this dynamic part of the equation, the level of free reserves (or borrowing) is related to the change in excess loan demand — that is, to flows of lending and open-market purchases. When excess loan demand becomes positive and increases steadily, borrowing will tend to rise cumulatively until the lagged stock terms balance off the flow terms.

The reader will note that interest-rate terms play a relatively small role in this equation. It is usual to suppose that member-bank borrowing is sensitive to the spread between the discount rate and the funds rate. The funds rate itself is, however, determined by the interactions among the banks which have been aggregated here. Indeed, in a more disaggregated model the funds rate would become an endogenous variable explained in large measure by the same variables which are supposed to determine the quantity of borrowing. In such a model the discount rate (if regarded as exogenous) would appear as a determinant of both the quantity of borrowing and the funds rate. It would in our view, however, appear more significantly as a determinant of the funds rate than of the amount borrowed. Moreover, there is considerable doubt as to the legitimacy of regarding the discount rate as an independent variable since the discount rate is often adjusted to keep it in line with the funds rate. Thus, while it is easy to find statistically significant coefficients on the discount rate, their economic significance is doubtful. The bill rate can be viewed as a measure of the costs of holding excess reserves for liquidity purposes.

To sum up, the banking system plays a major role as a demander of securities and as a supplier of time deposits and short-term marketable securities. Bank action in these markets is driven by the interaction of business loan demand — generated in turn by business surpluses and deficits and by Federal Reserve open-market operations.

Marketable Securities

In the case of marketable securities, we have estimated ordinary supply and demand equations for total long-term marketable securities, total short-term marketable securities, and municipal securities for sectors other than households. The resulting net supply of each type of securities must then be held by households. As noted above,

we could have completed the model by computing the household demands for securities and setting supply equal to demand. Instead, however, we have computed equations for various interest rates in which the rates appear on the left-hand side and the quantities of securities (actually various portfolio ratios) which must be absorbed by households — the net supply from other sectors — appear on the right-hand side.

There are several reasons for this choice. First, it is statistically more efficient. We have a linked set of household portfolio equations including those for several types of deposits and for different kinds of marketable securities. In these equations the deposit rates are exogenous since they are influenced only slightly by short-period movements in household portfolios. On the other hand, the quantities of securities to be absorbed by households are largely determined by events in the nonfinancial world and by monetary policy decisions which are little influenced by household portfolio decisions in the short run. The rates required to induce households to take the necessary amounts of securities are determined by household action including random shifts in the portfolio tastes of households. In OLS estimates there will be less simultaneous-equation bias when we normalize on the rate instead of on the quantities.

In effect, we have started from a set of simultaneous portfolio equations for households in which the quantities are functions of the yields on the different assets. Taking the quantities as predetermined, we have then solved for the yields in terms of the quantities. The yields which appear on the left side are current market yields. The right-hand side variables therefore include not only the composition of portfolio variables but also the measures of expected price changes which influence current security prices.

Variables intended to represent interest-rate expectations appear in a number of equations for the supply of or demand for securities. On the supply side the timing of corporate bond issues is significantly influenced by the rate of change of interest rates. Issues are deferred when rates move up rapidly and brought forward as rates decline [Eq. A4]. As one might expect, corporate short-term borrowing responds in the opposite way [Eq. A3]. State and local long-term borrowing responds to the rate of change of rates in roughly the same way as corporate borrowing.

On the demand side we find that the choice between long- and short-term securities by mutual savings banks and savings and loan associations is influenced by the spread between bond yields and a

moving average of short yields.¹¹ In choosing between long and short securities the household sector, represented by equations for long and short rates (H6 and H7), appears to respond to a) the difference between bond yields and a moving average of short rates and b) the rate of change of short rates.

There has been a good deal of debate in recent years over the merits of the so-called expectational theories of interest rates and the theories which emphasize the importance of the composition of securities in the market. Our model indicates that both factors are important. The moving averages of short rates which appear in the expectational models show up as significant in our equations of bond yields. But the composition of the volume of securities also shows up — as portfolio theories suggest it should — as an important factor. The simulations described below indicate that the cyclical swings in the relative volume of long- and short-term securities play a considerable role in producing term-structure changes.

The Mortgage Market

The demand for mortgages (supply of mortgage funds) comes primarily from savings and loan associations, mutual savings banks, life insurance companies, commercial banks, and Federal agencies. Without going into details, it is fair to say that except for the exogenous elements in FNMA and FHLB policy, the mortgage-demand equations are fairly straightforward examples of the general class of portfolio adjustment equations described in the previous section. Since the major purchasers of mortgages are intermediaries, the demand for mortgages is, of course, heavily influenced by the flow of funds to the intermediaries and thus ultimately reflects (a) household portfolio decisions, (b) Federal Reserve controls on the growth of banking assets, and (c) competition by corporations for short-term funds from banks and long-term funds from life insurance companies. While a chain of interactions resulting from those considerations is fairly elaborate, its basic logic is fairly straightforward and well understood.

¹¹We did not find a similar response on the part of life insurance companies whose short security holdings have remained at rather low levels for most of the period studied. However, since life insurance companies play such an important role in the bond markets, it may be that a change in their expectations forces changes in actual long-term rates rather than quantities. Life insurance rate expectations may therefore be reflected in the equations for the rates themselves.

The supply of mortgages — demand for mortgage funds — is more complex and less well understood and has received remarkably little attention in the literature. In the long run it seems reasonable to regard the supply of mortgages as dependent on the demand for the underlying capital — housing units — and by the portfolio choices of actual or potential owners of owner-occupied or rental housing units (and also in the aggregate by the forces governing the mix of owner-occupied and rental housing). Unfortunately, our knowledge of the ultimate determinants of housing demand is very limited, particularly in regard to the influence of a change in mortgage interest rates.

Moreover, while the demand for mortgage funds is basically related to the value of the stock of housing, much of the adjustment of the stock of mortgages through the stock of housing is associated with the refinancing connected with change of ownership. The rate of sale of existing houses fluctuates in the short run with the rate of construction of new units. Thus new building contributes to mortgage demand directly — since new units must be financed — and indirectly through its effect on the refinancing of old units. When the rate of home building increases, the percentage rate of growth of mortgages outstanding will tend to increase for both reasons.

Most of the observed fluctuations in the rate of home building in the postwar period have resulted from fluctuations in the supply of mortgage funds with a good deal of rationing. Observed changes in the rate of building therefore tell us very little about the demand for new construction. In the very short run, however, it can be argued that — in the absence of rationing — builders will tend to expand their activities when vacancies are low and contract them when the vacancy rate is high. The vacancy rate can therefore be used as a measure of short-run variation in the position of a demand function for mortgage funds. We can therefore write

$$\Delta\%MTGR = f(VAC, r_{mort}, r_{mrk}) + \text{trend}$$

where the interest-rate terms reflect the effect of interest rates on home occupancy costs and on the optimal leverage ration and the trend takes account of rising capital values and the “maturation” of mortgage portfolios in the postwar period.

If we supposed that the mortgage market was always cleared by prompt changes in interest rates, we could estimate the parameters in the demand function and determine the mortgage interest rate by setting the demand function equal to the supply of mortgage funds.

It is clear however that mortgage rates do not change quickly enough to clear the market when the supply of mortgage funds shifts

rapidly as it often does. We assume, therefore, when there is a gap between the supply and the demand for mortgage funds, that lenders shift the rate in the appropriate direction but not enough to eliminate the gap. Second, we assume that lenders lend the amount consistent with their supply function at the new rate, rationing out the excess demands. Third, we assume that the rate of change of the rate will also be affected by the differential between existing mortgage rates and competing asset yields and by the rate of growth of the intermediaries' total portfolios. A combination of the considerations determining the demand for mortgage funds and the rate adjustment considerations just mentioned leads to equation H-10 of Appendix B. This is, of course, a very crude representation of a very complex process, but it does seem to catch the major factors at work in the mortgage market.

The Link from the Financial to the Real Sector

Changes in financial variables impinge back upon the real sector through three aggregate demand categories: residential construction, business fixed investment, and state and local governments' construction expenditures. For the most part these equations follow the empirical work of previous models and require few specific comments.

The residential construction equation (A7 of Part II of Appendix B) simply translates a given change in the mortgage stock into a corresponding amount of expenditures. Since the expenditures are measured at annual rates, the equation implies that about 50 percent of the increase in the mortgage stock at the margin is reflected in higher construction in the current period with a further 25 percent in the following six months. The proportion of mortgage lending allocated to new construction versus the purchase of existing homes rises during periods of rapid household formation. Also the market for new housing appears to be more sharply affected by increased lending costs.

We also found it necessary to adjust the data of 1970 to 1971 for a very substantial rise in the refinancing of mortgages issued during the previous tight-money period. Ideally, it would be preferable to incorporate this refinancing phenomenon within the equation itself; but at present the number of observations is too limited to obtain meaningful results. The importance in recent years of refinancing is evident in the 237 percent increase between 1969 and 1971 in mortgage assets by savings and loans originated for purposes other than the purchase of a new or existing home.

The business-investment equations closely follow the neoclassical formulation used empirically by Bischoff in the FRB-MIT-PENN model. One implication of his particular formulation is that the effects of interest rates will be delayed behind those of output. Our equations differ only in two respects. First, the equations are not of a pure accelerator type where investment is related only to *changes* in the desired stock. They also include a level-of-output term. Second, our formulation of the firm's discount rate uses only the corporate bond rate with a coefficient of 1.0. Bischoff also includes a coefficient of 1.0 on the dividend-price ratio with a coefficient of 2.0 on the bond rate.

The state and local construction equation relates expenditures to a moving average of GNP (as a general scale variable) and interest rates. We have also included a measure of those Federal grants-in-aid which can be used for construction outlays.

As with most existing models, these linkages to the real sector are not fully satisfactory. We do not adjust the nominal interest rate for price effects as required by a real rate-of-interest formulation. Yet, we firmly believe that if the rate of inflation affects the nominal rate of interest, it must do so through the demand for physical assets. Thus, we do not include the rate of inflation in the interest-rate equations since total *financial* wealth is used as the balance-sheet restriction.¹² Since the rate of inflation can normally be expected to offset some of the influence on the real rate of interest of a changing nominal rate, our investment equations may overstate the influence of financial market changes on real output. On the other hand, we have not included a capital-gains impact on consumption as has been done in some of the larger models.

The Link From the Financial Sector

Within this model, the process by which events in the real sector affect the financial sector is more complex than is implied by models which utilize the aggregate demand and supply for money. This complexity results from the fact that the distribution of income and expenditures among the major sectors as well as the level of aggregate demand influences the supply and demand for various types of securities.

¹²We also did not find a significant statistical influence for previous rates of inflation if they were added to the rate equations as presently formulated.

The business sector finances fluctuations in its deficit primarily through variations in the amount of long-term debt and bank loans. State and local governments also are heavily dependent upon the longer-term capital markets. At the other extreme, the Federal government meets most of its immediate financing needs through its direct access to the short-term securities market. Such distinctions would be of little importance if the markets for financial assets other than money really were homogeneous as implied by a money-model approach; but this view is not supported by our empirical results.

On the savings side, households dominate the market for interest-bearing deposits which are of such importance for the residential mortgage market and homebuilding. In addition, the link between household savings on an income basis and their demand for financial assets is not a simple one. While their current consumption and investment in residential structures typically match the major proportion of their income flow, many of these expenditures are not financed out of current income, and thus need not be offset by a reduced rate of purchase of financial assets. Consumer credit and mortgages are two financial liabilities which are closely linked to the purchase of real assets. Most households do not view such debt as simply the negative equivalent of bonds or deposit accounts. Thus, they are not treated as homogenous elements of the households' decision with respect to the allocation of their financial wealth.¹³

The links to the financial sector are spelled out in greater detail in Appendix B. In addition, the pattern of sector deficits and its implications for credit markets and interest rates is discussed in the following analysis of some simulation results.

VII. SIMULATION RESULTS

The major characteristics of the model can be summarized by examining results of several standard "multiplier" simulations. These examples provide an opportunity to trace through the flow of the model and more adequately highlight the dynamic patterns of responses implied by the individual equations. All of the following exercises use data of the 1965-70 period as the baseline or control simulation. Consequently the results reflect the specific institutional

¹³We have also adjusted household savings and the deficit of state and local governments for contributions to employee pension funds. This provides a more symmetric treatment relative to private pension funds. A matching adjustment is not made for the Federal government since no independent fund is maintained.

framework that existed during the period. Because of major nonlinearities associated with rate ceilings and changes in regulation that occurred during that period, the multipliers that are obtained for that period cannot be viewed as being fully applicable to all other periods.

Unborrowed Reserves Multiplier

Within the present structure of the model, changes in unborrowed reserves are the primary index of the effectiveness of monetary policy. The results of a simulation of a \$1 billion increase in unborrowed reserves are shown in Table 2 of Appendix A. To put the magnitude of this increase in perspective, it is about a 5 percent increase and can be compared to the average annual increase of \$1.5 billion between 1965 and 1970 — the period of simulation.

The use of the six-month period introduces some simultaneous — within-period feedbacks — which somewhat blur the causal sequences for our simulation results. However, the model's first-period responses show how the effects of changes in unborrowed reserves are transmitted through the financial system into the real system and back again. The Federal Reserve open-market purchase in itself increases demand for government securities while at the same time increasing bank reserves. Banks respond to the improved reserve position, in part, by acquiring additional short-term securities. This results in a sharp decline (100 basis points) in bill rates and bank CD rates. The fall in short rates leads to substantial shifts of funds into time deposits and shares at thrift institutions and commercial banks. While the rise in unborrowed reserves and the inflow of time deposits permit a large increase in bank-earning assets, business loan demand is little changed. Our model of bank behavior implies that, since the excess loan variable has shown a sharp decline, Federal funds rates will fall and free reserves will increase. The simulation shows that in the initial period about half of the \$1-billion reserve injection is absorbed into free reserves. The temporary increase in free reserves is drawn down to approximately the initial position in the next two periods.

The increase in commercial-bank reserves strengthens commercial-bank demand for state and local securities which helps to produce a 60 basis point drop in the rates for those securities. The shift of household funds into commercial banks and thrift institutions leads to a rise in mortgage lending and residential construction of over \$1 billion in the initial period. The interest-rate decline also generates an increase of over \$1.5 billion in business-fixed investments, while the

resulting increase in income increases consumer expenditures by \$1 billion. The total first-period rise in GNP is a little over \$3 billion. In the first period these real-sector changes have limited financial implications.

An interesting side effect of the reserve injection is the expectationally induced shift in corporate financing. In spite of the sharp fall in short rates, corporations raise \$1.1 billion more in the long markets and correspondingly smaller amounts in short markets. This shift is the result of the expectations effects induced by the sharp decline in current market rates. And, of course, the shift in corporate financing toward the long end retards the decline in long rates.

The impact of monetary policy on real output is spread over a long period; real output reaches a peak at the end of two and a half years. However, the maximum change in real output is a very substantial \$20 billion. There is an immediate increase in residential construction in the first few periods with a peak of \$3.2 billion after 18 months. The long lag in the total monetary impact is accounted for by business investment which reaches its peak increase of \$7.3 billion at the end of three years. The increase in state and local construction is also very gradual.

The impact on output does not appear to be greatly dissimilar from those reported in some other studies. The total effect on real output is close to that found by Gramlich for a reduced form of estimates although the lags reported here appear to be somewhat longer. However, the impact is greater than that reported for previous versions of the FRB-MIT-Penn Model. This appears to be the result of a stronger response of business investment to interest-rate and output changes. This is amplified by a greater long-term impact of the policy change on market interest rates. The interest-rate response is heavily conditioned by the composition of debt issued in the capital markets and this aspect will be discussed more fully at the end of this section.

The policy change results in a substantial shift of deficit and surplus positions of the business and government sectors. The sharp rise in business investment results in much higher levels of business long-term borrowings. On the other hand, with expenditures being largely exogenous, substantial budget surpluses are generated by the Federal Government. This is reflected in the financial sector in a decline of outstanding short-term Federal securities. Thus, the particular assumptions of this model with regard to debt management result in a substantial maturity redistribution of credit-market assets. This pattern is amplified by the increase in state and local bond issues resulting from higher capital expenditures.

The nonbank intermediaries realize a higher level of deposit liabilities over the period of simulation. The most rapid deposit growth is concentrated in the first two years. But a major portion of these deposits are converted into larger holdings of mortgage assets with relatively small increases in their holdings of credit-market assets. The conversion of deposits into mortgages is facilitated by the fact that the mortgage rate initially declines by less than the bond rate and higher housing-vacancy rates begin to have a significant depressing influence only in the second and subsequent years. Life insurance companies do increase their holdings of long-term credit market assets; and FHLBB advances to savings and loans decline because the rate charged on these advances was held at its former exogenous level which has the effect of making such loans unattractive to S&Ls as market rates fall.

The above portfolio adjustments of borrowers and other lenders result in reduced household holdings of both short- and long-term securities for the first three years. But thereafter, their holdings of long-term securities rise and their holdings of short-term securities continue to decline. After six years total long-term assets have increased by \$6.1 billion, all of which has been absorbed by households. On the other hand, total short-term assets have increased by \$21 billion with households absorbing \$18 billion. The drop in Federal securities outstanding accounts for nearly all of the decline in short-term assets.

In response to these changes the short-term rate falls in the first six months by a full percentage point, and then begins to gradually return to former levels as aggregate demand and the total amount of borrowing rises. The 3-5 year bond rate also reaches its minimum in the first year but the subsequent recovery is more gradual. The long-term corporate bond rate continues to decline throughout the first two years and then begins to rise at a very gradual rate. This gradual response results in part from the long lag of the bond rate behind the Treasury bill rate implied by the bond rate equation.

The recovery of interest rates is further delayed by the particular pattern of debt management implied in the simulation, whereby short-term credit-market assets decline sharply (reflecting a continuing Federal government surplus) and long-term securities increase (reflecting greater business borrowing). In each of the three primary market-rate equations (RG3M, RG35, and RBAA), the decline in household holdings of short-term instruments has more of a depressive effect on rates than the upward pressure exerted by the rise in long-term instruments. Thus, the debt-management policies followed

in this simulation are an important component of the total expansionary effect. If the decline in government borrowing was more heavily concentrated in long-term securities, market rates would have recovered more rapidly and the rise in investment would have been choked off.¹⁴

Mortgage Purchases by the Federal National Mortgage Association. The exchange by FNMA of government marketable debt for residential mortgages is representative of an increasingly common type of financial policy. This might be classified as a type of debt management, but is substantially different from previous emphasis on the maturity distribution of the debt. An exercise in which FNMA mortgage assets are permanently raised by \$1 billion is shown in Table 3 of Appendix A.

An increase in FNMA mortgage holdings is obtained primarily from mortgage companies which originate the mortgages in the primary market. Consequently there is little immediate effect on the mortgage portfolios of the financial intermediaries. The rise in FNMA purchases is nearly fully reflected in a larger total mortgage stock. This in turn is translated into a correspondingly higher level of residential construction in the first year. The multiplier effect of the higher construction expenditures on other demand components is also substantial because of the complementary impact on consumer durable-goods purchases.

About \$.7 billion of the increased borrowing by FNMA is initially reflected in larger household holdings of short-term assets. However, only about \$.2 billion is drawn away from interest-bearing deposit accounts. Although personal savings do not rise, household financial wealth increases by \$.6 billion because part of the increased flow of mortgage funds is used to finance existing homes, so that household mortgage liabilities rise by more than their construction expenditures. In addition, households finance a portion of rising consumption with additional consumer credit. The remaining portion of the

¹⁴The conclusion of this model that debt management can have a substantial impact on the term structure of interest rates is at variance with several previous studies. Our results must be regarded as tentative, but they were obtained consistently from a variety of different formulations of the rate equation. Part of the difference in the results may be traceable to our use of the corporate bond rate as the basic measure of long-term yields. Thus, it includes a risk premium as well as liquidity and expectational effects. However, the tax laws have resulted in serious distortions in the government bond rate as a measure of long-term yields in recent years. Of possibly greater significance is our use of private as well as public debt instruments in measuring effects of debt maturity. Private long-term issues (corporate and State and local government) have grown enormously in the postwar period. In contrast, an index of the maturity of the Federal debt (used in prior studies) has consistently declined over the period. Thus, the debt maturity measure based on Federal securities alone is inversely correlated with that of the market as a whole.

FNMA financing is largely accounted for by a rise in business holdings of short-term assets and lower levels of FHLB advances. A rise of about 10 basis points in short-term rates is associated with these shifts in asset holdings. Thus, in spite of some negative feedbacks on alternative sources of mortgage funds, the FNMA operations do serve to stimulate homebuilding in the short run.

However, the relationship between mortgage lending and residential construction is a flow relationship so that no further stimulative effects are realized beyond the initial increase in the mortgage stock. In fact, aggregate demand will be reduced in future periods as the need to finance the mortgage purchases through higher government-agency lending raises market interest rates. This secondary effect reduces deposit inflows into the mortgage-lending institutions and causes some realignment of their portfolios toward the higher-yield credit-market assets. Business investment is restrained and the rate of expansion of the mortgage stock, and thus residential construction, declines. After the first 18 months the level of total demand is lower than in the control simulation.

Market interest rates initially rise in response to greater agency borrowing and private credit demands. In subsequent periods market rates decline back toward their former levels with some evidence of a long cycle. Because of the long lags, it is not clear what the equilibrium values would be but it appears to be a process of long damped cycles heading towards a zero long-term effect.

Federal Purchases Multiplier. The effects of increasing Federal purchases of goods by \$1 billion in constant 1958 dollars are shown in Table 4 of Appendix A. This provides a representative measure of the implied effectiveness of fiscal policy. Real output is raised by \$1.9 billion at annual rates in the first six months and reaches a peak of \$3.4 billion 18 months after the original stimulus. Thereafter the increment to aggregate demand gradually declines to \$1.2 billion after four and a half years. In the subsequent periods the model appears to follow a pattern of long damped oscillations declining towards zero. The current dollar multipliers, which rise from \$2 billion in the first period to \$4.4 billion after two years, may appear to be rather large; but this is simply because the price deflators (base, 1958 = 1.00) are very large during the period of simulation. For example, the constant dollar government stimulus of \$1 billion is valued at \$2.1 billion in current dollars at the end of the simulation period.

The simulation incorporates an assumption of an exogenous supply of unborrowed reserves. Therefore, the initial increase in demand raises interest rates and leads to offsetting reductions in the

demand categories of state and local expenditures, residential construction, and business investment. This response of aggregate demand to higher market rates is delayed and is not of major importance in the first year. Residential construction is reduced in the second and subsequent years both because higher market rates lead to lower deposits in the mortgage-lending institutions and because these institutions realign their own portfolios in the direction of higher-yield marketable securities. The accelerator effects of output dominate business investment in the first 18 months, but thereafter higher borrowing costs push the increment to investment demand back toward zero.

These multipliers seem to be slightly larger than those of other recent econometric models such as those of FRB-MIT-Penn and the Wharton Forecasting Unit. A substantial portion of these differences can be traced to the investment equations. Our equations imply a higher marginal capital-output ratio than is typically found in other models. Interest rates do very little to hold down the investment response in the first year because of lags in the adjustment of the bond rate to higher short-term rates and because the primary influence of interest rates on investment occurs in the second and third years. In addition, these equations are not pure accelerator-type formulations where investment is related only to *changes* in the desired capital stock. They include a level-of-output term. Finally, the present version of the model is estimated by ordinary least squares and the induced responses may be overestimated because of simultaneous-equation bias.

The tendency of the model to display a damped cycle reflects the delayed response of investment to higher market-interest rates. As a result, the initial rise in total output stimulates business investment; however, this accelerator effect becomes weaker in future periods as the negative influence of higher interest rates begins to dominate. But the effect of lower investment on total demand during this second phase causes the current interest rates to decline. Thus, there is a third phase during which investment and total output again increase. This cycle is amplified by the accelerator-type response of inventory investment and consumer durables.

The increase in Federal purchases is only partially offset by higher taxes and lower unemployment transfers so that there is a continuing need for Federal deficit financing. The magnitude of this need is somewhat arbitrary as it depends upon the assumptions with regard to other expenditures and tax policy. We have assumed that tax rates are exogenous so that revenue rises slightly more than proportionally with current-dollar GNP. On the other hand, only purchases of goods

and services are adjusted for inflation. Other expenditures are held basically constant in current-dollar terms with some negative effect from unemployment benefits. As a result of these assumptions, the demands placed on the capital market are less than half of the original expenditure stimulus. We have assumed that this deficit will be largely financed by increased issues of short-term government securities.

The business financing deficit follows the pattern of fixed investment with substantial borrowing needs occurring during periods of high investment. The fluctuations in corporate profits and inventory investment show strong accelerator effects and largely offset each other. For the first 18 months business borrowing is concentrated in short-term liabilities — principally bank loans. But these demands are shifted into long-term marketable securities in following periods as interest rates level out or decline from their peaks.

State and local demands on the capital market are reduced as construction outlays are reduced and there is a positive, though small, increase in tax revenue.¹⁵ This is reflected in lower long-term bond financing. The deficit of foreigners is reduced by high imports and exogenous constant-dollar exports. This is financed by a combination of more Euro-dollar loans to U.S. banks and higher foreign holdings of time deposits and short-term assets.

As a result of these changes in the basic-sector deficits, there is initially a substantial increase in total short-term debt financing with very little increase in long-term credit market instruments. This is amplified by the sale of short-term assets on the part of commercial banks to finance the higher level of bank loans. In future periods these effects are translated into the long-term market as business and the Federal government shift an increasing proportion of their financing to longer-term debt. It is partially offset by the lower level of state and local securities. This shift in composition of credit-market issues is evident in the \$.6 billion rise in short-term securities at the end of one year compared to a net increase of less than \$.1 billion for long-term assets. After six years long-term securities are above previous levels by \$1.6 billion compared to \$1.8 billion for short-term securities.

Since unborrowed reserves are held constant, commercial banks are unable to expand significantly their total assets. In fact, the decline of time deposits in response to higher market rates results in

¹⁵The elasticity of state and local revenue is low with respect to GNP because we have assumed that tax rates are exogenous. In addition, state and local expenditures are affected more by inflation than Federal expenditures in the model because of a much larger role of purchases of goods and services in total expenditures.

a redistribution of their liabilities toward demand deposits with a higher reserve requirement. They are forced to sell off some short-term securities to finance larger holdings of consumer credit and business loans. Nonbank intermediaries do reduce their holdings of residential mortgages, but this potential increase in funds available for credit market assets is partially offset by a lower level of deposit liabilities.

As a result of the above portfolio readjustments, the household sector is required to pick up most of the total increase in short-term assets plus those sold off by commercial banks. The total short-term holdings of households and pension funds under these circumstances rise by more than the increase in total outstandings. The nonbank intermediaries make a more substantial contribution to the long-term end of the market, so that the increase in household holdings of long-term credit-market assets is consistently less than 50 percent of the increase in total outstandings.

Within the framework of this model, the increase in household holdings of credit-market assets provides the primary impetus for higher market-interest rates. The three-to-five year bond rate is affected both by the level of household credit market asset-holdings relative to total financial wealth and the rate of change of this ratio. Second, there is a pronounced effect of asset composition on interest rates with a \$1 billion rise in short-term assets having a larger short- and long-run effect on market rates than a \$1 billion increase in long-term assets. Since the changes in credit-market holdings of the first few years are concentrated in the short end of the market, short-term market rates respond quickly to the rise in aggregate demand and reach their cyclical peak after 18 months. Long-term rates move more slowly with the increase in the first 18 months. Long-term rates move more slowly with the increase in the first 18 months being only one-half of the rise in short rates. But they continue to rise in future periods with a long-run increase greater than that for short- and intermediate-term rates. Since the longer-term rates provide the primary link back to the real sector, this delayed response gives an additional explanation for the substantial lag in monetary influence on total demand.

VIII. CONCLUSION

The present model and many of its implications must be regarded as tentative. At this point, we have emphasized the fact that the model produces a solution and that the behavior of the aggregates appear plausible relative to prior expectations. But many of the specific parameter estimates are subject to error and later revision.

Flow-of-funds models are still in their infancy and the quality of the available data for the knowledge of individual sectors' behavior is limited.

However, taken as a whole, the model provides an impressive amount of evidence that financial structure does matter. Particularly, in the short run, financial assets other than money reflect a lack of homogeneity in several dimensions. The multiplicity of significant relative interest-rate effects in the individual equations is demonstrative of the usefulness of the portfolio-balance approach to monetary analysis. Yet the formal theory must be significantly modified to incorporate *flow* as well as *stock* effects. The financial markets seem to be a world where both flows and stocks matter with both extremes being equally implausible. We hope that this model will provide a general framework within which more advanced work on specific sectors and markets can be evaluated.

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APPENDIX A
Simulation Results

Table 2 Unborrowed Reserves Multiplier

Table 3 Federal National Mortgage Association
Mortgage Purchase Multiplier

Table 4 Federal Purchases Multiplier

Table 5 Actual Values of Data

TABLE 2

CHANGES IN SELECTED VARIABLES FOR A \$1 BILLION INCREASE IN UNBORROWED RESERVES

	2.1 National Income Accounts (Seasonally adjusted at annual rates)											
	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
GROSS NATIONAL PRODUCT (1958\$)	3.1	8.9	14.8	18.5	20.2	19.8	18.2	15.7	13.4	12.3	11.2	10.4
PERSONAL CONSUMPTION	1.0	3.1	5.3	7.0	8.2	8.8	8.8	8.2	7.5	7.2	6.8	6.6
FIXED INVESTMENT	1.6	4.4	6.8	8.3	9.0	8.8	8.0	6.9	5.7	5.1	4.3	3.8
PRODUCER DURABLE GOODS	0.4	1.3	2.7	4.0	4.7	4.8	4.4	3.9	3.4	3.1	2.9	2.9
NONRESIDENTIAL CONSTRUCTION	0.1	0.3	0.9	1.6	2.2	2.5	2.4	2.2	1.7	1.4	1.2	1.1
RESIDENTIAL CONSTRUCTION	1.2	2.8	3.2	2.7	2.1	1.5	1.2	0.8	0.6	0.6	0.2	-0.2
INVENTORY INVESTMENT	0.5	1.3	2.5	2.9	2.5	1.5	0.4	-0.4	-0.8	-0.9	-0.7	-0.5
NET EXPORTS	-0.1	-0.3	-0.5	-0.7	-0.9	-1.0	-1.0	-1.0	-1.0	-1.1	-1.2	-1.3
GOVERNMENT PURCHASES												
FEDERAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STATE AND LOCAL	0.2	0.4	0.7	1.0	1.4	1.7	1.9	2.0	2.0	1.9	1.9	1.8
GROSS NATIONAL PRODUCT	3.2	9.4	16.2	21.3	24.9	26.9	28.1	28.5	29.4	31.8	34.3	37.2
DISPOSABLE INCOME	1.0	3.4	6.4	9.3	11.9	13.8	15.2	16.1	17.0	18.9	20.9	23.1
DISPOSABLE INCOME (1958\$)	1.0	3.3	5.9	8.0	9.6	10.3	10.2	9.4	8.6	8.3	8.0	7.7
PERSONAL SAVING	0.1	0.2	0.7	1.2	1.7	1.9	2.0	1.8	1.8	2.2	2.6	3.0
PRICES WAGES AND PRODUCTIVITY												
PRODUCTIVITY CHANGE (%)*	0.32	0.43	0.19	-0.05	-0.14	-0.19	-0.18	-0.18	-0.13	-0.07	-0.14	-0.15
WAGE CHANGE (%)*	0.02	0.06	0.13	0.21	0.29	0.34	0.36	0.37	0.37	0.37	0.37	0.37
NONFARM DEFLATOR CHANGE (%)*	-0.03	-0.03	0.04	0.10	0.17	0.22	0.26	0.28	0.29	0.30	0.32	0.32
UNEMPLOYMENT RATE	-0.001	-0.003	-0.006	-0.009	-0.011	-0.012	-0.011	-0.011	-0.010	-0.010	-0.009	-0.009

* Not in annual rates

2.2 Business Sector

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
EXTERNAL FINANCING DEFICIT*	0.4	1.6	4.3	6.5	8.1	8.0	7.4	6.5	5.7	5.5	5.6	6.0
CUMULATIVE FINANCING DEFICIT	0.2	1.0	3.2	6.4	10.4	14.4	18.1	21.4	24.2	27.0	29.8	32.8
UNPAID TAX LIABILITIES - FED.	0.3	0.9	1.3	1.6	1.1	1.0	0.9	0.6	0.5	0.4	0.4	0.4
UNPAID TAX LIABILITIES - S&L	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	-0.0
LONG TERM FINANCING	1.1	2.3	2.9	3.5	4.0	5.1	6.6	8.2	10.0	11.9	13.8	16.0
CORPORATE BONDS	0.6	1.1	0.8	0.5	0.7	1.8	3.5	5.3	7.2	8.9	10.6	12.3
CORPORATE STOCK	-0.0	-0.2	-0.3	-0.5	-0.7	-0.9	-0.9	-0.9	-0.9	-0.7	-0.6	-0.4
COMMERCIAL MORTGAGES	0.5	1.3	2.4	3.5	4.0	4.1	4.0	3.8	3.7	3.7	3.8	4.1
RESIDENTIAL MORTGAGE LIABILITIES	0.2	0.6	1.1	1.5	1.9	2.3	2.7	3.0	3.2	3.5	3.6	3.8
SHORT TERM FINANCING	-1.1	-1.9	-0.4	2.0	5.1	7.2	8.7	10.0	10.8	11.6	12.5	13.4
BANK LOANS	-0.5	-0.9	0.9	3.1	6.0	7.7	8.7	9.5	9.9	10.2	10.8	11.5
OPEN MARKET PAPER	-0.6	-1.0	-1.3	-1.2	-0.9	-0.5	-0.0	0.5	0.9	1.3	1.6	1.9
LIQUID ASSETS	-0.6	-0.1	0.6	1.2	1.2	0.9	0.7	0.6	0.5	0.5	0.5	0.6
MONEY	0.2	0.6	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2
TIME DEPOSITS	-0.1	-0.1	-0.2	-0.1	-0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
MARKETABLE SECURITIES	-0.7	-0.5	-0.0	0.4	0.4	0.1	-0.2	-0.4	-0.6	-0.7	-0.7	-0.6

2.3 Federal Government

BUDGET SURPLUS*	1.0	2.9	4.9	6.2	6.8	6.8	6.8	6.5	6.2	6.1	5.8	5.8
CUMULATIVE FINANCING DEFICIT	-0.5	-2.0	-4.4	-7.6	-11.0	-14.4	-17.8	-21.0	-24.1	-27.2	-30.1	-33.0
UNPAID TAX LIABILITIES(+)	0.3	0.9	1.3	1.6	1.1	1.0	0.9	0.6	0.5	0.4	0.4	0.4
FHLBA ADVANCES(+)	-1.2	-1.4	-2.0	-2.8	-3.2	-3.5	-3.3	-2.8	-2.3	-1.7	-0.7	-0.6
FNMA MORTGAGES(+)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CURRENCY(-)	0.02	0.08	0.16	0.24	0.32	0.38	0.43	0.46	0.49	0.53	0.60	0.67
UNBORROWED RESERVES(-)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
LONG TERM DEBT	-0.1	-0.3	-0.9	-1.8	-3.1	-4.7	-6.3	-8.0	-9.7	-11.3	-12.8	-14.3
SHORT TERM DEBT	-2.4	-3.3	-5.5	-8.2	-11.3	-13.6	-15.3	-16.6	-17.7	-18.7	-19.2	-20.6

* Flow variable measured at annual rates

2.4 State and Local Governments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
NIA BUDGET SURPLUS*												
CUMULATIVE FINANCING DEFICIT	-0.1	-0.1	-0.3	-0.6	-0.9	-1.4	-1.9	-2.2	-2.5	-2.7	-2.9	-3.2
UNPAID TAX LIABILITIES	0.0	0.1	0.2	0.5	1.0	1.7	2.6	3.7	5.0	6.3	7.8	9.3
LONG-TERM BONDS	0.6	1.2	1.6	1.6	1.1	0.8	0.7	1.0	1.5	2.2	3.2	4.4
SHORT-TERM DEBT	0.3	0.4	0.2	-0.1	-0.5	-0.8	-1.0	-1.2	-1.5	-1.7	-2.0	-2.3
FINANCIAL ASSETS	0.8	1.4	1.4	0.7	-0.6	-1.9	-3.1	-4.1	-5.0	-5.8	-6.6	-7.2
TIME DEPOSITS	0.9	1.1	1.1	0.4	-0.4	-1.0	-1.6	-2.1	-2.3	-2.3	-3.0	-3.8
SHORT TERM MARKET SECURITIES	0.2	0.1	-0.2	-0.4	-0.5	-0.4	-0.3	-0.3	-0.4	-0.4	-0.7	-0.7
LONG TERM MARKET SECURITIES	-0.3	0.2	0.6	0.7	0.3	-0.5	-1.2	-1.7	-2.3	-2.7	-2.8	-2.8

2.5 Commercial Banks

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
MONEY SUPPLY	2.50	3.71	5.42	6.23	7.00	7.31	6.89	6.32	5.94	5.78	6.13	6.31
CURRENCY	0.02	0.08	0.16	0.24	0.32	0.38	0.43	0.46	0.49	0.53	0.60	0.67
TIME DEPOSITS	4.6	7.3	9.6	9.1	8.2	8.0	7.8	7.4	7.6	7.9	8.1	8.0
HOUSEHOLDS	3.7	6.2	8.6	8.7	8.6	9.0	9.2	9.3	9.6	9.9	10.8	11.4
BUSINESS	-0.1	-0.1	-0.2	-0.1	-0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
STATE AND LOCAL GOVERNMENTS	0.9	1.1	1.1	0.4	-0.4	-1.0	-1.6	-2.1	-2.3	-2.3	-3.0	-3.8
FOREIGN	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3
EURODOLLAR LOANS	0.0	0.0	-3.4	-3.1	-2.8	-2.8	-2.7	-2.6	-2.7	-2.9	-2.9	-2.8
EARNING ASSETS	6.6	10.3	10.5	11.0	11.1	11.1	10.4	9.7	9.4	9.4	9.8	9.8
BANK LOANS TO BUSINESS	-0.5	-0.9	0.9	3.1	6.0	7.7	8.7	9.5	9.9	10.2	10.8	11.5
RESIDENTIAL MORTGAGES	0.2	0.8	1.6	2.1	2.4	2.4	2.1	1.7	1.4	1.0	0.8	0.6
CONSUMER CREDIT	2.0	0.8	1.4	1.9	2.3	2.6	2.8	2.8	2.7	2.7	2.6	2.6
STATE AND LOCAL BONDS	0.2	3.0	3.3	3.2	2.8	2.4	1.9	1.5	1.1	1.0	0.9	0.8
U.S. GOVERNMENT BONDS	0.4	0.8	1.1	1.1	0.9	0.5	0.1	-0.3	-0.7	-1.1	-1.4	-1.6
OTHER LONG TERM ASSETS	0.3	0.6	0.8	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8
FREE RESERVES	0.54	0.31	0.04	-0.08	-0.10	-0.12	-0.07	-0.01	0.05	0.07	0.05	0.06
SHORT TERM CREDIT ASSETS	3.7	4.9	1.4	-1.4	-4.3	-5.5	-6.1	-6.5	-5.9	-5.3	-4.8	-4.9
MEMBER BANKS												
DEMAND DEPOSITS	2.09	3.06	4.43	5.02	5.62	5.77	5.40	4.88	4.52	4.30	4.44	4.54
TIME DEPOSITS	3.79	6.08	7.82	7.40	6.65	6.20	6.20	6.02	5.95	6.14	6.15	6.15
EXCESS LOAN DEMAND	-8.69	-9.66	-8.46	-5.09	-2.00	-0.37	0.75	1.26	1.41	1.22	1.47	1.71
UNBORROWED RESERVES	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

* Flow variables measured at annual rates

2.6 Nonbank Intermediaries

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
SAVINGS AND LOAN												
DEPOSITS	2.7	4.4	5.7	6.9	7.7	8.8	9.7	10.6	11.7	13.2	13.3	14.2
FEDERAL HOME LOAN ADVANCES	-1.2	-1.4	-2.0	-2.8	-3.2	-3.5	-3.3	-2.8	-2.3	-1.7	-0.7	-0.6
RESIDENTIAL MORTGAGES	0.7	1.9	3.0	3.9	4.8	5.9	7.2	8.6	10.0	11.4	12.3	12.7
SHORT TERM ASSETS	0.5	0.4	-0.0	-0.5	-0.7	-0.8	-0.6	-0.4	-0.1	0.2	0.3	0.6
LONG TERM ASSETS	0.2	0.4	0.5	0.4	0.1	-0.2	-0.6	-0.9	-1.0	-0.9	-0.7	-0.3
SAVINGS BANKS												
DEPOSITS	0.6	1.0	1.3	1.6	1.8	2.1	2.3	2.6	3.0	3.4	3.5	3.8
RESIDENTIAL MORTGAGES	0.3	0.7	1.3	2.0	2.6	3.2	3.6	3.9	4.1	4.2	4.3	4.4
SHORT TERM ASSETS	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
LONG TERM ASSETS	0.2	0.2	-0.0	-0.3	-0.7	-1.0	-1.2	-1.2	-1.1	-0.9	-0.7	-0.6
LIFE INSURANCE COS.												
RESERVES	0.4	0.8	1.2	1.6	1.9	2.1	2.4	2.6	2.7	2.9	3.0	3.2
RESIDENTIAL MORTGAGES	0.1	0.2	0.6	1.2	1.8	2.4	2.9	3.2	3.3	3.2	3.0	2.9
SHORT-TERM ASSETS	0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.4	-0.5	-0.5	-0.6	-0.6	-0.6
LONG TERM ASSETS	0.2	0.7	1.0	1.0	0.7	0.4	0.2	0.2	0.4	0.7	1.1	1.4

2.7 Household Sector

PERSONAL SAVING*	0.1	0.2	0.7	1.2	1.7	1.9	2.0	1.8	1.8	2.2	2.6	3.0
RESIDENTIAL INVESTMENT*	1.3	3.2	3.8	3.2	2.6	2.0	1.7	1.3	1.2	1.2	0.7	0.2
NET FINANCIAL INVESTMENT*	-0.8	-2.0	-2.1	-1.3	-0.0	0.5	0.7	0.9	1.0	1.4	2.1	2.9
CONSUMER CREDIT LIABILITIES	0.3	1.1	2.4	3.6	4.7	5.5	6.2	6.6	6.7	6.9	7.0	7.2
RESIDENTIAL MORTGAGE LIABILITY	1.0	3.1	5.5	7.7	9.7	11.5	13.1	14.4	15.5	16.4	16.7	16.9
NET ACCUM. OF FIN. ASSETS*	1.8	3.8	5.1	5.7	6.1	5.9	5.3	4.3	3.5	3.6	3.0	3.4
STOCK OF FINANCIAL ASSETS	0.9	2.8	5.4	8.2	11.3	14.2	16.8	19.0	20.7	22.5	24.0	25.8
DEPOSITS												
TIME DEPOSITS	3.7	6.2	8.6	8.7	8.6	9.0	9.2	9.3	9.6	9.9	10.8	11.4
SAVINGS AND LOAN DEPOSITS	2.7	4.4	5.7	6.9	7.7	8.8	9.7	10.6	11.7	13.2	13.3	14.2
SAVINGS BANK DEPOSITS	0.6	1.0	1.3	1.6	1.8	2.1	2.3	2.6	3.0	3.4	3.5	3.8
LIFE INSURANCE RESERVES	0.4	0.8	1.2	1.6	1.9	2.1	2.4	2.6	2.7	2.9	3.0	3.2
SHORT TERM MARKET ASSETS	-6.8	-9.3	-11.6	-11.3	-10.8	-11.7	-12.4	-13.0	-14.4	-15.7	-16.5	-17.8
LONG TERM ASSETS	-1.0	-2.3	-3.4	-3.9	-3.6	-2.3	-0.3	1.5	3.2	4.3	5.1	6.2

* Flow variable measured at annual rates

2.8 Interest Rates

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1970-1	1970-2
MARKET RATES											
THREE MONTH BILL RATE	-1.087	-0.984	-0.784	-0.325	-0.075	-0.161	-0.243	-0.308	-0.451	-0.543	-0.512
3-5 YEAR BOND RATE	-1.176	-1.170	-1.323	-1.017	-0.833	-0.840	-0.783	-0.738	-0.796	-0.829	-0.830
CORPORATE BAA BOND RATE	-0.456	-0.768	-0.948	-1.065	-1.049	-1.056	-1.000	-0.903	-0.852	-0.823	-0.844
CONVENTIONAL MORTGAGE RATE	-0.460	-0.579	-0.710	-0.744	-0.714	-0.737	-0.736	-0.715	-0.725	-0.748	-0.683
STATE AND LOCAL BOND RATE	-0.595	-0.751	-0.900	-0.846	-0.786	-0.794	-0.772	-0.742	-0.761	-0.784	-0.773
INSTITUTIONAL RATES											
CERTIFICATE OF DEPOSIT RATE	-1.025	-1.028	-0.844	-0.362	-0.093	-0.118	-0.170	-0.221	-0.354	-0.448	-0.366
SAVINGS BANK DEPOSIT RATE	-0.121	-0.235	-0.331	-0.248	-0.205	-0.176	-0.141	-0.105	-0.075	-0.045	-0.090
S&L DEPOSIT RATE	-0.079	-0.196	-0.299	-0.218	-0.181	-0.147	-0.114	-0.081	-0.056	-0.026	-0.072
HOUSEHOLD DEPOSIT RATE	-0.038	-0.076	-0.119	-0.122	-0.097	-0.077	-0.057	-0.037	-0.024	-0.016	-0.027
BANK LOAN RATE	-0.672	-0.944	-0.956	-0.783	-0.578	-0.517	-0.475	-0.432	-0.458	-0.491	-0.472

2.9 Residential Mortgage Markets

TOTAL LIABILITIES	1.2	3.7	6.5	9.2	11.6	13.8	15.8	17.4	18.7	19.9	20.3	20.6
HOUSEHOLDS	1.0	3.1	5.5	7.7	9.7	11.5	13.1	14.4	15.5	16.4	16.7	16.9
BUSINESS	0.2	0.6	1.1	1.5	1.9	2.3	2.7	3.0	3.2	3.5	3.6	3.8
TOTAL ASSETS												
SAVINGS AND LOAN	0.7	1.9	3.0	3.9	4.8	5.9	7.2	8.6	10.0	11.4	12.3	12.7
SAVINGS BANKS	0.3	0.7	1.3	2.0	2.6	3.2	3.6	3.9	4.1	4.2	4.3	4.4
LIFE INSURANCE	0.1	0.2	0.6	1.2	1.8	2.4	2.9	3.2	3.3	3.2	3.0	2.9
COMMERCIAL BANKS	0.2	0.8	1.6	2.1	2.4	2.4	2.1	1.7	1.4	1.0	0.8	0.6
FEDERAL (FNMA)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADDENDA												
FHLBA ADVANCES	-1.2	-1.4	-2.0	-2.8	-3.2	-3.5	-3.3	-2.8	-2.3	-1.7	-0.7	-0.6
MORTGAGE RATE	-0.460	-0.579	-0.710	-0.744	-0.714	-0.737	-0.736	-0.715	-0.725	-0.748	-0.672	-0.683
MORTGAGE STOCK CHANGE(%)	0.55	1.02	1.08	0.97	0.81	0.65	0.53	0.36	0.22	0.17	-0.03	-0.11
VACANCY RATE(%)	0.00	0.00	0.01	0.07	0.12	0.16	0.17	0.17	0.17	0.17	0.17	0.15

2.10 Long Term Credit Market Instruments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
TOTAL ISSUES	1.6	3.2	3.6	3.2	2.0	1.2	1.0	1.2	1.9	2.9	4.2	6.1
BUSINESS	1.1	2.3	2.9	2.9	4.0	5.1	6.6	8.2	10.0	11.9	13.8	16.0
CORPORATE BONDS	0.6	1.1	0.8	0.5	0.7	1.8	3.5	5.3	7.2	8.9	10.6	12.3
CORPORATE STOCK	-0.0	-0.2	-0.3	-0.5	-0.7	-0.9	-0.9	-0.9	-0.9	-0.7	-0.6	-0.4
COMMERCIAL MORTGAGES	0.5	1.3	2.4	3.5	4.0	4.1	4.0	3.8	3.7	3.7	3.8	4.1
STATE AND LOCAL GOVERNMENTS	0.6	1.2	1.6	1.6	1.1	0.8	0.7	1.0	1.5	2.2	3.2	4.4
FEDERAL GOVERNMENT	-0.1	-0.3	-0.9	-1.8	-3.1	-4.7	-6.3	-8.0	-9.7	-11.3	-12.8	-14.3
HOLDERS												
COMMERCIAL BANKS	2.3	3.9	5.0	5.3	5.2	4.7	4.0	3.3	2.8	2.4	2.3	2.2
SAVINGS AND LOANS	0.2	0.4	0.5	0.4	0.1	-0.2	-0.6	-0.9	-1.0	-0.9	-0.7	-0.3
SAVINGS BANKS	0.2	0.2	-0.0	-0.3	-0.7	-1.0	-1.2	-1.2	-1.1	-0.9	-0.7	-0.6
LIFE INSURANCE	0.2	0.7	1.0	1.0	0.7	0.4	0.2	0.2	0.4	0.7	1.1	1.4
STATE AND LOCAL GOVERNMENT	-0.3	0.2	0.6	0.7	0.3	-0.5	-1.2	-1.7	-2.3	-2.7	-2.8	-2.8
FOREIGN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOUSEHOLDS AND OTHERS	-1.0	-2.3	-3.4	-3.9	-3.6	-2.3	-0.3	1.5	3.2	4.3	5.1	6.2

2.11 Short Term Credit Market Instruments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
TOTAL ISSUES	-2.7	-3.8	-6.5	-9.5	-12.7	-14.8	-16.3	-17.4	-18.3	-19.1	-19.5	-21.0
BUSINESS	-0.6	-1.0	-1.3	-1.2	-0.9	-0.5	-0.0	0.5	0.9	1.3	1.6	1.9
U.S. GOVERNMENT	-2.4	-3.3	-5.5	-8.2	-11.3	-13.6	-15.3	-16.6	-17.7	-18.7	-19.2	-20.6
STATE AND LOCAL GOVERNMENT	0.3	0.4	0.2	-0.1	-0.5	-0.8	-1.0	-1.2	-1.5	-1.7	-2.0	-2.3
COMMERCIAL BANKS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FOREIGN SECTOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLDERS												
BUSINESS	-0.7	-0.5	-0.0	0.4	0.4	0.1	-0.2	-0.4	-0.6	-0.7	-0.7	-0.6
STATE AND LOCAL GOVERNMENT	0.2	0.1	-0.2	-0.4	-0.5	-0.4	-0.3	-0.3	-0.4	-0.8	-0.7	-0.7
FOREIGN	-0.0	0.1	3.8	3.9	4.0	4.4	4.7	4.8	5.0	5.2	5.8	5.1
COMMERCIAL BANKS	3.9	5.3	1.6	-1.5	-4.8	-6.2	-7.1	-7.7	-7.4	-7.0	-6.8	-7.2
SAVINGS AND LOANS	0.5	0.4	-0.0	-0.5	-0.7	-0.8	-0.6	-0.4	-0.1	0.2	0.3	0.5
SAVINGS BANKS	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
LIFE INSURANCE	0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.4	-0.5	-0.5	-0.6	-0.6	-0.6
HOUSEHOLDS AND OTHERS	-6.8	-9.3	-11.6	-11.3	-10.8	-11.7	-12.4	-13.0	-14.4	-15.7	-16.5	-17.8

TABLE 3

CHANGES IN SELECTED VARIABLES FOR \$1 BILLION INCREASE IN FNMA MORTGAGE PURCHASES

3.1 National Income Accounts

(Seasonally adjusted at annual rates)

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
GROSS NATIONAL PRODUCT(1958\$)	2.0	1.2	0.4	-0.8	-1.4	-1.8	-1.7	-1.2	-0.7	-0.1	0.2	0.3
PERSONAL CONSUMPTION	0.7	0.5	0.3	-0.1	-0.4	-0.6	-0.7	-0.6	-0.5	-0.2	-0.1	0.0
FIXED INVESTMENT	1.1	0.5	-0.0	-0.3	-0.5	-0.7	-0.7	-0.5	-0.3	-0.0	0.1	0.2
PRODUCER DURABLE GOODS	0.2	0.3	0.1	-0.1	-0.3	-0.4	-0.4	-0.3	-0.2	-0.1	0.0	0.1
NONRESIDENTIAL CONSTRUCTION	0.0	0.1	0.0	-0.0	-0.1	-0.2	-0.2	-0.2	-0.1	-0.0	0.0	0.0
RESIDENTIAL CONSTRUCTION	0.8	0.2	-0.2	-0.2	-0.1	-0.1	-0.0	-0.0	0.0	0.0	0.1	0.1
INVENTORY INVESTMENT	0.3	0.2	0.2	-0.4	-0.4	-0.5	-0.2	-0.0	0.1	0.2	0.2	0.2
NET EXPORTS	-0.1	-0.1	-0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-0.0
GOVERNMENT PURCHASES												
FEDERAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STATE AND LOCAL	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
GROSS NATIONAL PRODUCT	2.0	1.3	0.7	-0.5	-1.1	-1.6	-1.6	-1.3	-0.8	-0.3	0.1	0.2
DISPOSABLE INCOME	0.7	0.6	0.6	0.1	-0.3	-0.6	-0.7	-0.7	-0.5	-0.3	-0.1	-0.0
DISPOSABLE INCOME(1958\$)	0.7	0.6	0.4	-0.1	-0.5	-0.7	-0.8	-0.7	-0.5	-0.2	-0.1	0.0
PERSONAL SAVING	0.0	0.0	0.1	-0.0	-0.1	-0.1	-0.1	-0.0	0.0	0.0	-0.0	-0.0
PRICES WAGES AND PRODUCTIVITY												
PRODUCTIVITY CHANGE(%)	0.20	-0.17	-0.12	-0.04	0.04	0.02	0.03	0.02	0.01	0.01	0.00	0.00
WAGE CHANGE(%)	0.01	0.01	0.03	0.01	-0.00	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01	-0.00
NONFARM DEFLATOR CHANGE(%)	-0.02	0.03	0.03	0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00
UNEMPLOYMENT RATE	-0.001	-0.001	-0.001	-0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	-0.000

3.2 Business Sector

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
EXTERNAL FINANCING DEFICIT*	0.3	0.4	0.5	-0.3	-0.7	-0.9	-0.8	-0.5	-0.2	0.1	0.2	0.2
CUMULATIVE FINANCING DEFICIT	0.2	0.4	0.6	0.5	0.1	-0.3	-0.7	-0.9	-1.0	-1.0	-0.9	-0.7
UNPAID TAX LIABILITIES - FED.	0.0	0.1	-0.0	-0.2	-0.1	-0.1	-0.1	-0.0	0.0	0.0	-0.0	-0.0
UNPAID TAX LIABILITIES - S&L	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	0.0
LONG TERM FINANCING	-0.0	-0.0	-0.0	0.0	0.2	0.2	0.1	-0.1	-0.2	-0.3	-0.4	-0.4
CORPORATE BONDS	-0.0	-0.1	0.0	0.1	0.2	0.2	0.1	-0.1	-0.2	-0.4	-0.4	-0.4
CORPORATE STOCK	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
COMMERCIAL MORTGAGES	-0.0	-0.0	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
RESIDENTIAL MORTGAGE LIABILITIES	0.1	0.1	0.1	0.0	0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
SHORT TERM FINANCING	0.1	0.3	0.5	0.3	-0.1	-0.4	-0.5	-0.6	-0.5	-0.4	-0.3	-0.3
BANK LOANS	0.0	0.2	0.3	0.2	-0.2	-0.5	-0.5	-0.5	-0.4	-0.3	-0.2	-0.2
OPEN MARKET PAPER	0.0	0.1	0.1	0.2	0.1	0.1	0.0	-0.0	-0.1	-0.1	-0.1	-0.0
LIQUID ASSETS	0.3	0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.1	0.0	-0.0	-0.1
MONEY	0.0	-0.0	-0.0	-0.1	-0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
TIME DEPOSITS	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.0
MARKETABLE SECURITIES	0.2	0.1	-0.0	-0.1	-0.1	-0.0	0.0	0.1	0.1	0.1	0.1	0.0

3.3 Federal Government

BUDGET SURPLUS*	0.7	0.4	0.1	-0.3	-0.4	-0.6	-0.6	-0.4	-0.2	-0.0	0.1	0.1
CUMULATIVE FINANCING DEFICIT	-0.3	-0.5	-0.6	-0.4	-0.2	0.1	0.4	0.6	0.7	0.7	0.7	0.6
UNPAID TAX LIABILITIES(+)	0.2	0.1	-0.0	-0.2	-0.1	-0.1	-0.1	-0.1	-0.0	0.0	-0.0	-0.0
FHLBA ADVANCES(+)	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-0.1	-0.2	-0.3	-0.4	-0.4
FNMA MORTGAGES(+)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CURRENCY(-)	0.01	0.01	0.01	0.01	-0.00	-0.01	-0.01	-0.01	0.00	0.01	0.01	0.01
UNBORROWED RESERVES(-)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LONG TERM DEBT	-0.0	-0.1	-0.2	-0.2	-0.2	-0.1	-0.0	0.1	0.2	0.3	0.3	0.3
SHORT TERM DEBT	0.9	0.7	0.6	0.7	0.9	1.1	1.3	1.3	1.3	1.1	1.0	0.8

* Flow variable measured at annual rates

3.4 State and Local Governments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
NIA BUDGET SURPLUS*	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
CUMULATIVE FINANCING DEFICIT	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.5
UNPAID TAX LIABILITIES	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	0.0
LONG-TERM BONDS	-0.0	-0.1	-0.2	-0.2	-0.1	-0.1	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2
SHORT-TERM DEBT	-0.0	-0.1	-0.1	-0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
FINANCIAL ASSETS	-0.1	-0.1	-0.1	-0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
TIME DEPOSITS	-0.1	-0.1	-0.1	-0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2
SHORT TERM MARKET SECURITIES	-0.0	-0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
LONG TERM MARKET SECURITIES	0.0	-0.0	-0.0	-0.0	-0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1

3.5 Commercial Banks

MONEY SUPPLY	0.34	0.39	0.29	0.20	-0.04	-0.10	-0.03	0.12	0.26	0.32	0.28	0.17
CURRENCY	0.01	0.01	0.01	0.01	-0.00	-0.01	-0.01	-0.01	0.00	0.01	0.01	0.01
TIME DEPOSITS	-0.1	-0.4	-0.6	-0.6	-0.3	-0.2	-0.3	-0.2	-0.5	-0.6	-0.6	-0.3
HOUSEHOLDS	-0.0	-0.3	-0.5	-0.5	-0.4	-0.3	-0.4	-0.4	-0.5	-0.5	-0.5	-0.3
BUSINESS	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.0
STATE AND LOCAL GOVERNMENTS	-0.1	-0.1	-0.1	-0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2
FOREIGN	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1
EURODOLLAR LOANS	0.0	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1
EARNING ASSETS	0.2	-0.0	-0.1	-0.2	-0.3	-0.2	-0.2	-0.0	-0.1	-0.1	-0.1	-0.0
BANK LOANS TO BUSINESS	0.0	0.2	0.3	0.2	-0.2	-0.5	-0.5	-0.5	-0.4	-0.3	-0.2	-0.2
RESIDENTIAL MORTGAGES	0.0	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.0	-0.0	0.0	0.0	-0.0
CONSUMER CREDIT	0.1	0.2	0.2	0.1	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	-0.0	0.0
STATE AND LOCAL BONDS	0.0	-0.1	-0.1	-0.1	-0.1	-0.0	0.0	0.1	0.1	0.1	0.1	0.1
U.S. GOVERNMENT BONDS	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.0	0.1	0.1	0.1	0.1	0.1
OTHER LONG TERM ASSETS	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	0.0	-0.0
FREE RESERVES	-0.04	-0.03	-0.02	-0.00	0.01	0.02	0.01	-0.01	-0.02	-0.02	-0.02	-0.01
SHORT TERM CREDIT ASSETS	0.1	-0.3	-0.4	-0.2	0.2	0.5	0.6	0.6	0.3	0.1	-0.0	0.0
MEMBER BANKS	0.28	0.32	0.23	0.16	-0.03	-0.07	-0.01	0.11	0.22	0.26	0.22	0.13
DEMAND DEPOSITS	-0.07	-0.32	-0.47	-0.51	-0.26	-0.18	-0.20	-0.20	-0.39	-0.49	-0.42	-0.19
TIME DEPOSITS	0.18	0.57	0.73	0.50	-0.05	-0.37	-0.45	-0.43	-0.18	0.03	0.10	0.01
EXCESS LOAN DEMAND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNBORROWED RESERVES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* Flow variables measured at annual rates

3.6 Nonbank Intermediaries

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
SAVINGS AND LOAN												
DEPOSITS	-0.1	-0.3	-0.4	-0.5	-0.5	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
FEDERAL HOME LOAN ADVANCES	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-0.1	-0.2	-0.3	-0.4	-0.4
RESIDENTIAL MORTGAGES	-0.1	-0.2	-0.3	-0.4	-0.5	-0.5	-0.6	-0.7	-0.8	-0.9	-0.9	-0.9
SHORT TERM ASSETS	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	-0.0	-0.0	-0.1
LONG TERM ASSETS	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.1	0.1	0.0	0.0	-0.0
SAVINGS BANKS												
DEPOSITS	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
RESIDENTIAL MORTGAGES	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5
SHORT TERM ASSETS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LONG TERM ASSETS	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
LIFE INSURANCE COS.												
RESERVES	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
RESIDENTIAL MORTGAGES	0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.4	-0.4	-0.5
SHORT-TERM ASSETS	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
LONG TERM ASSETS	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2

3.7 Household Sector

PERSONAL SAVING*	0.0	0.0	0.1	-0.0	-0.1	-0.1	-0.1	-0.0	0.0	0.0	-0.0	-0.0
RESIDENTIAL INVESTMENT*	0.9	0.2	-0.2	-0.2	-0.1	-0.1	-0.0	-0.0	0.0	0.1	0.1	0.1
NET FINANCIAL INVESTMENT*	-0.6	-0.2	0.3	0.2	0.0	-0.1	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1
CONSUMER CREDIT LIABILITIES	0.2	0.3	0.3	0.2	-0.0	-0.2	-0.3	-0.4	-0.4	-0.3	-0.2	-0.1
RESIDENTIAL MORTGAGE LIABILITY	0.8	0.5	0.3	0.2	0.0	-0.1	-0.3	-0.4	-0.5	-0.6	-0.7	-0.7
NET ACCUM. OF FIN. ASSETS*	1.3	-0.4	-0.1	-0.4	-0.7	-0.7	-0.6	-0.4	-0.2	-0.0	0.0	-0.0
STOCK OF FINANCIAL ASSETS	0.6	0.4	0.4	0.2	-0.2	-0.5	-0.8	-1.0	-1.1	-1.1	-1.1	-1.1
DEPOSITS												
TIME DEPOSITS	-0.0	-0.3	-0.5	-0.5	-0.4	-0.3	-0.4	-0.4	-0.5	-0.5	-0.5	-0.3
SAVINGS AND LOAN DEPOSITS	-0.1	-0.3	-0.4	-0.5	-0.5	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
SAVINGS BANK DEPOSITS	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
LIFE INSURANCE RESERVES	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
SHORT TERM MARKET ASSETS	0.7	1.0	1.3	1.1	0.8	0.6	0.7	0.7	0.8	0.9	0.9	0.8
LONG TERM ASSETS	-0.2	-0.2	-0.2	-0.1	-0.0	-0.1	-0.3	-0.6	-0.8	-0.9	-0.9	-0.9

* Flow variable measured at annual rates

3.8 Interest Rates

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
MARKET RATES												
THREE MONTH BILL RATE	0.108	0.086	0.091	0.022	-0.033	-0.029	-0.003	0.012	0.037	0.043	0.035	0.024
3-5 YEAR BOND RATE	0.099	0.078	0.108	0.056	0.017	0.014	0.020	0.015	0.027	0.023	0.018	0.014
CORPORATE BAA BOND RATE	0.034	0.049	0.074	0.079	0.066	0.059	0.051	0.037	0.030	0.028	0.026	0.026
CONVENTIONAL MORTGAGE RATE	-0.026	0.049	0.054	0.038	0.018	0.009	0.003	-0.007	-0.011	-0.019	-0.024	-0.034
STATE AND LOCAL BOND RATE	0.043	0.050	0.070	0.058	0.038	0.033	0.033	0.028	0.032	0.031	0.028	0.023
INSTITUTIONAL RATES												
CERTIFICATE OF DEPOSIT RATE	0.101	0.084	0.095	0.000	-0.024	-0.030	-0.009	0.003	0.000	0.000	0.000	0.023
SAVINGS BANK DEPOSIT RATE	-0.007	0.008	0.017	0.011	0.007	0.004	0.002	0.000	-0.000	-0.001	-0.004	-0.003
S&L DEPOSIT RATE	-0.005	0.007	0.014	0.009	0.006	0.003	0.002	0.000	-0.000	-0.000	-0.004	-0.002
HOUSEHOLD DEPOSIT RATE	0.003	0.005	0.009	0.009	0.006	0.003	0.002	0.000	-0.000	0.000	0.001	0.001
BANK LOAN RATE	0.057	0.065	0.090	0.068	0.031	0.013	0.011	0.007	0.016	0.023	0.025	0.022

3.9 Residential Mortgage Market

TOTAL LIABILITIES	0.9	0.6	0.4	0.2	0.0	0.0	-0.2	-0.3	-0.5	-0.6	-0.7	-0.8	-0.9
HOUSEHOLDS	0.8	0.5	0.3	0.2	0.0	0.0	-0.1	-0.3	-0.4	-0.5	-0.6	-0.7	-0.7
BUSINESS	0.1	0.1	0.1	0.0	0.0	0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
TOTAL ASSETS													
SAVINGS AND LOAN	-0.1	-0.2	-0.3	-0.4	-0.5	-0.5	-0.6	-0.7	-0.8	-0.9	-0.9	-0.9	
SAVINGS BANKS	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5	
LIFE INSURANCE	0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.4	-0.4	-0.5	
COMMERCIAL BANKS	0.0	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.0	0.0	0.0	-0.0	
FEDERAL (FNMA)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
ADDENDA													
FHLBA ADVANCES	0.1	0.1	0.1	0.1	0.1	0.1	0.0	-0.1	-0.2	-0.3	-0.4	-0.4	
MORTGAGE RATE	-0.026	0.049	0.064	0.038	0.018	0.009	0.003	-0.007	-0.011	-0.019	-0.024	-0.034	
MORTGAGE STOCK CHANGE(%)	0.39	-0.14	-0.09	-0.07	-0.07	-0.07	-0.07	-0.05	-0.04	-0.02	-0.02	-0.02	
VACANCY RATE(%)	0.00	0.01	0.04	0.05	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.08	

3.10 Long Term Credit Market Instruments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
TOTAL ISSUES	-0.1	-0.2	-0.4	-0.4	-0.2	-0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.3
BUSINESS	-0.0	-0.0	-0.0	0.0	0.2	0.2	0.1	-0.1	-0.2	-0.3	-0.4	-0.4
CORPORATE BONDS	-0.0	-0.1	0.0	0.1	0.2	0.2	0.1	-0.1	-0.2	-0.4	-0.4	-0.4
CORPORATE STOCK	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
COMMERCIAL MORTGAGES	-0.0	-0.0	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
STATE AND LOCAL GOVERNMENTS	-0.0	-0.1	-0.2	-0.2	-0.1	-0.1	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2
FEDERAL GOVERNMENT	-0.0	-0.1	-0.2	-0.2	-0.2	-0.1	-0.0	0.1	0.2	0.3	0.3	0.3
HOLDERS												
COMMERCIAL BANKS	0.0	-0.0	-0.2	-0.2	-0.2	-0.2	-0.1	0.1	0.1	0.1	0.1	0.1
SAVINGS AND LOANS	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.1	0.1	0.0	0.0	-0.0
SAVINGS BANKS	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
LIFE INSURANCE	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
STATE AND LOCAL GOVERNMENTS	0.0	-0.0	-0.0	-0.0	-0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.1
FOREIGN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOUSEHOLDS AND OTHERS	-0.2	-0.2	-0.2	-0.1	-0.0	-0.1	-0.3	-0.6	-0.8	-0.9	-0.9	-0.9

3.11 Short Term Credit Market Instruments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
TOTAL ISSUES	0.9	0.8	0.7	0.9	1.1	1.3	1.4	1.4	1.3	1.1	1.0	0.9
BUSINESS	0.0	0.1	0.1	0.2	0.1	0.1	0.0	-0.0	-0.1	-0.1	-0.1	-0.0
U.S. GOVERNMENT	0.9	0.7	0.6	0.7	0.9	1.1	1.3	1.3	1.3	1.1	1.0	0.8
STATE AND LOCAL GOVERNMENT	-0.0	-0.1	-0.1	-0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
COMMERCIAL BANKS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FOREIGN SECTOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLDERS												
BUSINESS	0.2	0.1	-0.0	-0.1	-0.1	-0.0	0.0	0.1	0.1	0.1	0.1	0.0
STATE AND LOCAL GOVERNMENT	-0.0	-0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
FOREIGN	0.0	0.1	-0.1	-0.1	-0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.1
COMMERCIAL BANKS	0.0	-0.4	-0.4	-0.2	0.3	0.5	0.6	0.6	0.4	0.2	0.1	0.1
SAVINGS AND LOAN	-0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	-0.0	-0.0	-0.1
SAVINGS BANKS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIFE INSURANCE	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
HOUSEHOLDS AND OTHERS	0.7	1.0	1.3	1.1	0.8	0.6	0.7	0.7	0.8	0.9	0.9	0.8

4.2 Business Sector

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
EXTERNAL FINANCING DEFICIT*	-0.0	0.3	0.8	0.7	0.5	0.1	-0.1	-0.2	-0.2	-0.1	0.2	0.5
CUMULATIVE FINANCING DEFICIT	-0.0	0.1	0.5	0.9	1.1	1.2	1.1	1.0	0.9	0.9	1.0	1.2
UNPAID TAX LIABILITIES - FED.	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.2
UNPAID TAX LIABILITIES - S&L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LONG TERM FINANCING	0.0	0.0	0.0	0.1	0.3	0.5	0.7	0.9	0.9	1.0	1.0	1.1
CORPORATE BONDS	-0.0	-0.0	-0.1	0.0	0.2	0.3	0.4	0.5	0.4	0.4	0.4	0.4
CORPORATE STOCK	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5
COMMERCIAL MORTGAGES	0.0	0.0	-0.0	-0.0	-0.1	-0.0	0.0	0.1	0.1	0.1	0.2	0.2
RESIDENTIAL MORTGAGE LIABILITIES	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4
SHORT TERM FINANCING	-0.1	0.0	0.4	0.5	0.6	0.4	0.3	0.2	0.2	0.2	0.3	0.4
BANK LOANS	-0.1	0.0	0.3	0.4	0.3	0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.0
OPEN MARKET PAPER	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
LIQUID ASSETS	0.1	0.2	0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
MONEY	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
TIME DEPOSITS	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	-0.0	-0.1	-0.1	-0.0
MARKETABLE SECURITIES	0.1	0.1	0.0	0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.1	0.1	-0.0

4.3 Federal Government

BUDGET SURPLUS*	-0.5	-0.3	-0.0	-0.1	-0.2	-0.4	-0.5	-0.6	-0.6	-0.6	-0.5	-0.3
CUMULATIVE FINANCING DEFICIT	0.3	0.4	0.4	0.5	0.6	0.7	1.0	1.3	1.5	1.8	2.1	2.2
UNPAID TAX LIABILITIES(+)	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
FILBA ADVANCES(+)	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.0	-0.0
FNMA MORTGAGES(+)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CURRENCY(-)	0.01	0.02	0.03	0.04	0.04	0.05	0.05	0.05	0.06	0.07	0.08	0.09
UNBORROWED RESERVES(-)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LONG TERM DEBT	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.8	1.0
SHORT TERM DEBT	0.4	0.6	0.6	0.6	0.6	0.7	0.9	1.1	1.2	1.3	1.3	1.3

* Flow variable measured at annual rates

4.4 State and Local Governments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
NIA BUDGET SURPLUS*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
CUMULATIVE FINANCING DEFICIT	-0.0	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	0.4	-0.5	-0.6	-0.6	-0.8
UNPAID TAX LIABILITIES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LONG-TERM BONDS	-0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4
SHORT-TERM DEBT	-0.0	-0.0	-0.1	-0.1	-0.0	-0.0	0.0	0.0	0.0	0.1	0.1	0.1
FINANCIAL ASSETS	-0.0	-0.0	-0.1	-0.1	-0.1	0.0	0.1	0.2	0.2	0.3	0.4	0.4
TIME DEPOSITS	-0.0	-0.1	-0.1	-0.3	-0.0	0.0	0.0	0.1	-0.1	-0.0	-0.0	0.2
SHORT TERM MARKET SECURITIES	-0.0	-0.0	0.0	0.2	-0.0	0.0	0.0	-0.0	0.1	0.2	0.2	-0.0
LONG TERM MARKET SECURITIES	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0	0.1	0.2	0.2	0.2	0.2

4.5 Commercial Banks

MONEY SUPPLY	0.12	0.30	0.42	0.58	0.33	0.30	0.28	0.29	0.48	0.52	0.59	0.58
CURRENCY	0.01	0.02	0.03	0.04	0.04	0.05	0.05	0.05	0.06	0.07	0.08	0.09
TIME DEPOSITS	-0.0	-0.2	-0.4	-1.0	-0.5	-0.3	-0.2	-0.3	-0.9	-1.1	-1.1	-0.7
HOUSEHOLDS	-0.0	-0.1	-0.3	-0.6	-0.4	-0.3	-0.3	-0.4	-0.7	-0.9	-0.9	-0.7
BUSINESS	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	-0.0	-0.1	-0.1	-0.0
STATE AND LOCAL GOVERNMENTS	-0.0	-0.1	-0.1	-0.3	-0.0	0.0	0.1	0.1	0.1	-0.0	-0.0	0.2
FOREIGN	-0.0	-0.0	-0.0	-0.1	-0.1	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1
EURODOLLAR LOANS	0.0	0.0	0.2	0.4	0.2	0.1	0.1	0.1	0.3	0.4	0.4	0.2
EARNING ASSETS	0.1	0.1	0.1	-0.1	-0.1	0.0	0.1	0.0	-0.2	-0.3	-0.2	0.0
BANK LOANS TO BUSINESS	-0.1	0.0	0.3	0.4	0.3	0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.0
RESIDENTIAL MORTGAGES	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
CONSUMER CREDIT	0.1	0.2	0.3	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8
STATE AND LOCAL BONDS	0.0	-0.0	-0.0	-0.1	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2
U.S. GOVERNMENT BONDS	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
OTHER LONG TERM ASSETS	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1
FREE RESERVES	-0.01	-0.03	-0.04	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	-0.04
SHORT TERM CREDIT ASSETS	0.1	-0.1	-0.4	-0.8	-0.8	-0.5	-0.4	-0.4	-0.5	-0.6	-0.6	-0.6
MEMBER BANKS												
DEMAND DEPOSITS	0.10	0.24	0.33	0.45	0.24	0.21	0.19	0.20	0.35	0.37	0.41	0.40
TIME DEPOSITS	-0.04	-0.14	-0.32	-0.80	-0.43	-0.22	-0.16	-0.26	-0.72	-0.86	-0.85	-0.52
EXCESS LOAN DEMAND	0.00	0.24	0.68	1.16	0.93	0.67	0.52	0.83	0.90	0.90	0.90	0.90
UNBORROWED RESERVES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* Flow variables measured at annual rates

4.6 Nonbank Intermediaries

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2	1970-2
SAVINGS AND LOAN													
DEPOSITS	-0.0	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.6	-0.8	-0.9	-0.8	-0.9	-0.9
FEDERAL HOME LOAN ADVANCES	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.0	-0.0
RESIDENTIAL MORTGAGES	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.6	-0.8	-0.9	-1.0	-1.0
SHORT TERM ASSETS	-0.0	-0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LONG TERM ASSETS	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	0.1	0.1	0.1	0.1
SAVINGS BANKS													
DEPOSITS	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2
RESIDENTIAL MORTGAGES	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.5	-0.5	-0.6	-0.6
SHORT TERM ASSETS	-0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LONG TERM ASSETS	-0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3
LIFE INSURANCE COS.													
RESERVES	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
RESIDENTIAL MORTGAGES	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4
SHORT-TERM ASSETS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
LONG TERM ASSETS	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4

4.7 Household Sector

PERSONAL SAVING*	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.4	0.5	0.5	0.5
RESIDENTIAL INVESTMENT*	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.0
NET FINANCIAL INVESTMENT*	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.3	0.4	0.5	0.5	0.5	0.5
CONSUMER CREDIT LIABILITIES	0.1	0.3	0.5	0.8	0.9	1.0	1.0	1.0	0.9	0.9	1.0	1.1	1.1
RESIDENTIAL MORTGAGE LIABILITY	-0.0	-0.0	-0.1	-0.2	-0.4	-0.6	-0.8	-1.0	-1.3	-1.5	-1.7	-1.9	-1.9
NET ACCUM. OF FIN. ASSETS*	0.4	0.6	0.7	0.5	0.3	0.1	-0.1	-0.2	-0.3	-0.1	0.2	0.4	0.4
STOCK OF FINANCIAL ASSETS	0.2	0.5	0.9	1.2	1.4	1.4	1.4	1.3	1.1	1.1	1.2	1.4	1.4
DEPOSITS													
TIME DEPOSITS	-0.0	-0.1	-0.3	-0.6	-0.4	-0.3	-0.3	-0.4	-0.7	-0.9	-0.9	-0.7	-0.7
SAVINGS AND LOAN DEPOSITS	-0.0	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.6	-0.8	-0.9	-0.8	-0.9	-0.9
SAVINGS BANK DEPOSITS	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2
LIFE INSURANCE RESERVES	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
SHORT TERM MARKET ASSETS													
SHORT TERM MARKET ASSETS	0.2	0.5	1.0	1.4	1.4	1.2	1.2	1.4	1.6	1.7	1.8	2.0	2.0
LONG TERM ASSETS	-0.1	-0.1	-0.1	0.0	0.2	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7

* Flow variables measured at annual rates

4.8 Interest Rates

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
MARKET RATES												
THREE MONTH BILL RATE	0.042	0.074	0.114	0.099	0.060	0.029	0.025	0.057	0.066	0.062	0.061	0.087
3-5 YEAR BOND RATE	0.037	0.063	0.108	0.100	0.081	0.067	0.064	0.090	0.089	0.080	0.077	0.101
CORPORATE BAA BOND RATE	0.015	0.035	0.065	0.087	0.098	0.103	0.104	0.111	0.113	0.109	0.112	0.121
CONVENTIONAL MORTGAGE RATE	0.009	0.021	0.042	0.055	0.056	0.054	0.053	0.063	0.063	0.057	0.044	0.050
STATE AND LOCAL BOND RATE	0.016	0.031	0.057	0.071	0.064	0.059	0.058	0.072	0.082	0.083	0.081	0.086
INSTITUTIONAL RATES												
CERTIFICATE OF DEPOSIT RATE	0.040	0.069	0.105	0.000	0.074	0.041	0.034	0.061	0.000	0.000	0.000	0.095
SAVINGS BANK DEPOSIT RATE	0.002	0.007	0.015	0.013	0.011	0.009	0.007	0.006	0.004	0.002	0.008	0.005
S&L DEPOSIT RATE	0.002	0.005	0.012	0.010	0.008	0.006	0.004	0.003	0.003	0.001	0.008	0.004
HOUSEHOLD DEPOSIT RATE	0.001	0.003	0.008	0.009	0.009	0.007	0.005	0.004	0.003	0.002	0.005	0.004
BANK LOAN RATE	0.023	0.046	0.085	0.106	0.105	0.089	0.081	0.092	0.097	0.100	0.103	0.117

4.9 Residential Mortgage Market

TOTAL LIABILITIES	-0.0	-0.0	-0.1	-0.3	-0.5	-0.7	-0.9	-1.2	-1.5	-1.8	-2.1	-2.3
HOUSEHOLDS	-0.0	-0.0	-0.1	-0.2	-0.4	-0.6	-0.8	-1.0	-1.3	-1.5	-1.7	-1.9
BUSINESS	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4
TOTAL ASSETS												
SAVINGS AND LOAN	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.6	-0.8	-0.9	-1.0
SAVINGS BANKS	-0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.5	-0.5	-0.6
LIFE INSURANCE	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4
COMMERCIAL BANKS	0.0	0.0	-0.0	-0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
FEDERAL(FNMA)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
APPENDIX												
FHLBA ADVANCES	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.0	-0.0
MORTGAGE RATE	0.009	0.021	0.042	0.055	0.056	0.054	0.053	0.063	0.063	0.057	0.044	0.050
MORTGAGE STOCK CHANGE(%)	-0.00	-0.01	-0.04	-0.06	-0.07	-0.07	-0.07	-0.09	-0.09	-0.09	-0.06	-0.05
VACANCY RATE(%)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03

4.10 Long Term Credit Market Instruments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
TOTAL ISSUES	0.0	0.0	0.0	0.1	0.3	0.6	0.9	1.0	1.2	1.3	1.5	1.6
BUSINESS	0.0	0.0	0.0	0.1	0.3	0.5	0.7	0.9	0.9	1.0	1.0	1.1
CORPORATE BONDS	-0.0	-0.0	-0.1	0.0	0.2	0.3	0.4	0.5	0.4	0.4	0.4	0.4
COMMERCIAL MORTGAGES	0.0	0.0	-0.0	-0.0	-0.1	-0.0	0.0	0.1	0.1	0.1	0.2	0.2
STATE AND LOCAL GOVERNMENTS	-0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4
FEDERAL GOVERNMENT	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.6	0.7	0.8	1.0
HOLDERS												
COMMERCIAL BANKS	0.0	0.1	0.1	-0.0	-0.0	-0.1	-0.0	-0.0	-0.1	-0.1	-0.1	-0.0
SAVINGS AND LOANS	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	0.1	0.1	0.1
SAVINGS BANKS	-0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
LIFE INSURANCE	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4
STATE AND LOCAL GOVERNMENT	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0	0.1	0.2	0.2	0.2	0.2
FOREIGN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOUSEHOLDS AND OTHERS	-0.1	-0.1	-0.1	0.0	0.2	0.4	0.5	0.5	0.5	0.6	0.7	0.7

4.11 Short Term Credit Market Instruments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
TOTAL ISSUES	0.4	0.6	0.6	0.7	0.8	1.0	1.2	1.4	1.6	1.7	1.8	1.8
BUSINESS	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
U.S. GOVERNMENT	0.4	0.6	0.6	0.6	0.6	0.7	0.9	1.1	1.2	1.3	1.3	1.3
STATE AND LOCAL GOVERNMENT	-0.0	-0.0	-0.1	-0.1	-0.0	-0.0	0.0	0.0	0.0	0.1	0.1	0.1
COMMERCIAL BANKS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FOREIGN SECTOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HOLDERS												
BUSINESS	0.1	0.1	0.0	0.1	-0.1	-0.2	-0.2	-0.1	0.0	0.1	0.1	-0.0
STATE AND LOCAL GOVERNMENT	-0.0	-0.0	0.0	0.2	-0.0	0.0	0.0	-0.0	0.1	0.2	0.2	-0.0
FOREIGN	0.0	0.1	-0.0	-0.1	0.1	0.3	0.3	0.3	0.1	0.0	0.0	0.2
COMMERCIAL BANKS	0.1	-0.1	-0.5	-0.8	-0.8	-0.5	-0.4	-0.4	-0.5	-0.5	-0.5	-0.5
SAVINGS AND LOAN	-0.0	-0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
SAVINGS BANKS	-0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LIFE INSURANCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
HOUSEHOLDS AND OTHERS	0.2	0.5	1.0	1.4	1.4	1.4	1.2	1.4	1.6	1.7	1.8	2.0

TABLE 5
ACTUAL VALUES OF SELECTED VARIABLES

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
5.1 National Income Accounts (Seasonally adjusted at annual rates)												
GROSS NATIONAL PRODUCT(1958\$)	606.0	629.6	652.1	664.1	669.1	681.2	699.0	714.4	724.1	727.2	721.8	722.4
PERSONAL CONSUMPTION	390.7	404.8	415.2	421.0	427.3	433.0	446.5	459.0	467.4	470.9	475.5	478.4
FIXED INVESTMENT	87.7	92.7	95.8	95.0	92.1	95.1	98.5	99.1	103.8	103.7	100.5	99.4
PRODUCER DURABLE GOODS	42.4	45.7	48.8	51.4	50.5	50.7	51.7	52.8	55.5	56.1	54.9	53.2
NONRESIDENTIAL CONSTRUCTION	21.4	23.2	24.2	23.8	23.0	22.2	23.5	23.2	23.8	24.8	24.0	23.2
RESIDENTIAL CONSTRUCTION	23.9	23.8	22.9	19.7	18.6	22.2	23.2	23.2	24.6	22.8	21.7	23.0
INVENTORY INVESTMENT	9.9	9.4	13.7	15.9	7.0	9.4	6.3	7.9	7.5	8.1	3.9	5.9
NET EXPORTS	6.2	6.2	5.2	3.2	4.1	3.2	1.3	0.6	-0.4	0.8	1.9	2.4
GOVERNMENT PURCHASES												
FEDERAL	56.8	59.1	62.9	68.0	73.9	75.5	77.9	78.2	75.0	71.9	66.9	62.5
STATE AND LOCAL	55.5	58.0	60.0	62.2	65.1	66.0	68.9	70.3	71.9	72.9	73.7	74.9
GROSS NATIONAL PRODUCT	669.2	700.6	736.4	763.3	779.5	808.4	845.7	882.7	915.3	945.3	964.9	988.0
DISPOSABLE INCOME	460.3	486.2	502.9	520.8	537.4	555.3	581.7	600.3	619.1	649.7	677.6	701.5
DISPOSABLE INCOME(1958\$)	424.2	445.5	454.1	463.7	473.3	481.8	495.5	502.5	507.7	519.2	529.2	537.2
PERSONAL SAVING	24.8	32.1	30.4	34.7	38.5	42.3	42.9	36.6	32.9	43.6	51.1	58.6
PRICES WAGES AND PRODUCTIVITY												
PRODUCTIVITY CHANGE(%)	1.06	2.11	1.44	0.54	0.38	1.18	1.80	0.81	-0.44	-0.45	-0.10	1.92
WAGE CHANGE(%)	2.02	1.81	2.10	2.05	2.62	2.50	3.32	3.20	3.15	3.37	3.08	3.57
NONFARM DEFLECTOR CHANGE(%)	0.83	0.35	1.05	1.78	1.56	1.69	1.71	1.86	2.24	2.44	2.49	2.40
UNEMPLOYMENT RATE	0.048	0.042	0.038	0.037	0.038	0.039	0.036	0.035	0.034	0.036	0.045	0.055

5.2 Business Sector

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
EXTERNAL FINANCING DEFICIT*	16.9	17.4	22.1	24.5	15.1	18.6	18.8	23.0	30.2	35.1	32.9	30.9
CUMULATIVE FINANCING DEFICIT	227.5	236.2	247.2	259.5	267.0	276.3	285.7	297.2	312.3	329.9	346.3	361.8
UNPAID TAX LIABILITIES - FED.	17.7	18.3	16.9	17.6	12.7	13.2	15.8	14.8	13.5	12.3	10.3	9.3
UNPAID TAX LIABILITIES - S&L	1.5	1.6	1.7	1.8	1.9	2.1	2.6	2.8	2.5	2.1	1.7	1.3
LONG TERM FINANCING	345.7	351.3	362.1	369.2	379.2	391.9	401.5	411.3	422.2	434.8	449.9	469.7
CORPORATE BONDS	110.1	113.9	120.0	124.9	132.0	140.6	147.0	154.3	161.7	168.0	177.6	190.8
CORPORATE STOCK	183.3	182.9	184.3	184.1	184.8	186.4	186.6	185.6	186.2	189.9	193.0	196.7
COMMERCIAL MORTGAGES	52.3	54.5	57.7	60.1	62.4	64.8	67.9	71.4	74.3	76.9	79.3	82.3
RESIDENTIAL MORTGAGE LIABILITY	37.8	39.7	41.6	41.9	44.1	46.6	48.4	50.4	52.6	54.6	56.9	60.8
SHORT TERM FINANCING	85.7	93.6	101.4	107.1	112.6	116.6	123.1	134.1	146.8	158.4	164.8	164.2
BANK LOANS	76.2	83.7	90.4	92.8	96.0	98.7	103.6	112.0	121.2	128.6	132.8	131.7
OPEN MARKET PAPER	9.5	9.9	11.0	14.4	16.5	17.9	19.4	22.1	25.6	29.8	32.0	32.5
LIQUID ASSETS	70.4	71.1	73.1	67.7	65.7	72.7	76.6	78.4	79.6	78.4	80.4	77.6
MONEY	32.8	33.0	33.9	33.6	33.3	35.4	36.2	36.8	37.0	38.7	38.8	39.2
TIME DEPOSITS	12.5	13.1	13.4	11.7	12.9	13.8	13.8	14.2	13.4	11.8	11.5	13.5
MARKETABLE SECURITIES	25.1	24.9	25.7	22.3	19.5	23.5	26.6	27.4	29.1	27.9	30.1	24.9

5.3 Federal Government

BUDGET SURPLUS*	4.6	-2.1	2.2	-2.7	-12.1	-12.7	-10.5	-2.5	10.7	5.5	-8.6	-17.2
CUMULATIVE FINANCING DEFICIT	221.0	222.0	220.9	222.2	228.3	234.6	239.8	241.1	235.7	232.9	237.2	245.8
UNPAID TAX LIABILITIES(+)	17.7	18.3	16.9	17.6	12.7	13.2	15.8	14.8	13.5	12.3	10.3	9.3
FHLBA ADVANCES(+)	5.9	6.0	7.1	6.9	4.6	4.4	5.2	5.3	6.8	9.3	10.7	10.6
FNMA MORTGAGES(+)	2.1	2.5	3.7	4.4	4.6	5.5	6.7	7.2	8.3	11.0	13.9	16.4
CURRENCY(-)	35.00	36.30	37.40	38.30	39.30	40.40	41.90	43.40	44.70	46.00	47.70	49.00
UNBORROWED RESERVES(-)	21,282	21,713	21,956	22,724	23,557	24,422	25,262	26,665	26,539	26,352	26,793	28,477
LONG TERM DEBT	59.8	55.2	52.5	49.0	44.7	42.1	43.9	45.1	41.1	36.5	35.0	34.6
SHORT TERM DEBT	124.5	128.1	134.4	136.5	137.8	150.7	156.9	160.1	163.8	171.8	181.4	189.6

* Flow variable measured at annual rates

5.6 Nonbank Intermediaries

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
SAVINGS AND LOAN DEPOSITS	106.0	110.4	112.3	114.0	119.9	124.6	128.2	132.0	135.0	135.9	138.7	146.8
FEDERAL HOME LOAN ADVANCES	5.9	6.0	7.1	6.9	4.6	4.4	5.2	5.3	6.8	9.3	10.7	10.6
RESIDENTIAL MORTGAGES	96.1	100.1	103.4	104.4	106.3	110.3	114.2	118.5	123.5	127.3	130.4	135.9
SHORT TERM ASSETS	4.8	5.0	5.2	5.9	7.5	8.3	8.8	8.6	9.4	9.5	10.9	12.7
LONG TERM ASSETS	11.8	12.2	12.2	12.1	12.0	12.3	12.9	13.7	13.4	13.3	12.8	13.5
SAVINGS BANKS DEPOSITS	50.9	52.7	53.6	55.3	58.1	60.4	62.4	64.6	66.2	67.2	68.6	71.6
RESIDENTIAL MORTGAGES	38.3	40.2	41.2	42.3	43.6	44.7	45.5	46.7	47.8	48.6	49.1	49.9
SHORT TERM ASSETS	3.0	3.0	3.1	3.2	3.2	3.4	3.8	3.5	3.8	3.5	3.7	3.9
LONG TERM ASSETS	12.6	12.5	12.5	12.6	13.9	15.0	16.0	17.1	17.7	18.0	18.7	20.0
LIFE INSURANCE COS. RESERVES	114.0	117.1	119.9	122.3	125.5	128.9	131.9	135.1	137.9	140.3	143.0	146.4
RESIDENTIAL MORTGAGES	37.1	38.4	39.7	40.5	41.2	41.5	41.6	41.8	42.0	42.1	42.4	42.7
SHORT-TERM ASSETS	1.2	1.1	0.9	1.2	1.5	1.3	1.4	1.6	1.6	2.4	2.7	3.4
LONG TERM ASSETS	88.9	91.6	93.9	95.5	98.0	101.5	105.0	108.5	111.3	113.3	116.2	118.6

5.7 Household Sector

PERSONAL SAVING*	24.8	32.1	30.4	34.7	38.5	42.3	42.9	36.6	32.9	43.6	51.1	58.6
RESIDENTIAL INVESTMENT*	27.2	27.3	26.7	23.4	22.5	27.7	29.7	30.6	33.3	31.9	30.4	31.9
NET FINANCIAL INVESTMENT*	16.9	22.8	21.9	27.8	34.5	35.9	34.1	29.2	23.8	36.2	47.7	54.3
CONSUMER CREDIT LIABILITIES	96.6	102.1	107.0	109.6	112.1	116.1	121.8	130.0	136.7	141.7	144.5	147.7
RESIDENTIAL MORTGAGE LIABILITY	198.5	206.3	213.4	218.6	222.4	229.1	236.6	244.0	252.5	260.2	266.1	272.7
NET ACCUM. OF FIN. ASSETS*	43.1	49.5	45.7	43.5	47.1	57.3	60.3	60.5	54.2	61.7	65.2	73.8
STOCK OF FINANCIAL ASSETS	1187.9	1240.8	1293.0	1345.6	1401.4	1463.7	1529.0	1596.0	1661.3	1732.0	1806.3	1886.9
DEPOSITS												
TIME DEPOSITS	107.2	115.2	122.7	128.3	138.8	146.4	153.2	163.8	164.2	161.9	168.9	189.4
SAVINGS AND LOAN DEPOSITS	106.0	110.4	112.3	114.0	119.9	124.6	128.2	132.0	135.0	135.9	138.7	146.8
SAVINGS BANK DEPOSITS	50.9	52.7	53.6	55.3	58.1	60.4	62.4	64.6	66.2	67.2	68.6	71.6
LIFE INSURANCE RESERVES	114.0	117.1	119.9	122.3	125.5	128.9	131.9	135.1	137.9	140.3	143.0	146.4
SHORT TERM MARKET ASSETS	26.5	29.7	35.0	41.4	38.0	37.8	42.5	45.6	53.1	63.1	69.0	56.3
LONG TERM ASSETS	364.2	365.6	373.0	379.0	381.0	386.7	392.2	392.8	399.8	414.0	425.5	443.6

* Flow variable measured at annual rates

5.8 Interest Rates

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1970-1	1970-2	
MARKET RATES												
THREE MONTH BILL RATE	3.881	4.010	4.592	5.115	4.085	4.518	5.277	5.389	6.139	7.179	6.935	5.840
3-5 YEAR BOND RATE	4.100	4.350	4.945	5.380	4.675	5.470	5.705	5.490	6.275	7.450	7.740	6.945
CORPORATE BAA BOND RATE	4.805	4.930	5.330	6.005	5.930	6.525	6.925	6.945	7.485	8.145	8.870	9.345
CONVENTIONAL MORTGAGE RATE	5.830	5.905	6.230	6.665	6.510	6.980	6.960	7.340	7.735	8.300	8.575	8.525
STATE AND LOCAL BOND RATE	3.062	3.269	3.503	3.833	3.562	3.912	4.162	4.232	5.010	5.894	6.354	5.890
INSTITUTIONAL RATES												
CERTIFICATE OF DEPOSIT RATE	4.245	4.375	5.145	5.500	4.965	5.025	5.680	5.890	6.000	6.000	6.750	6.905
SAVINGS BANK DEPOSIT RATE	4.170	4.200	4.324	4.712	4.775	4.791	4.818	4.860	4.921	4.968	5.542	5.817
S&L DEPOSIT RATE	4.333	4.370	4.508	4.821	4.972	4.974	5.023	5.086	5.166	5.199	5.762	5.846
HOUSEHOLD DEPOSIT RATE	3.828	3.974	4.424	4.733	4.725	4.756	4.836	4.866	4.880	4.885	5.543	5.591
BANK LOAN RATE	4.810	4.965	5.515	6.135	5.870	5.785	6.430	6.580	7.420	8.655	8.505	8.115

5.9 Residential Mortgage Rate

TOTAL LIABILITIES	236.4	246.1	255.0	260.5	266.5	275.8	284.9	294.4	305.1	314.9	323.1	333.6
HOUSEHOLDS	198.5	206.3	213.4	218.6	222.4	229.1	236.6	244.0	252.5	260.2	266.1	272.7
BUSINESS	37.8	39.7	41.6	41.9	44.1	46.6	48.4	50.4	52.6	54.6	56.9	60.8
TOTAL ASSETS												
SAVINGS AND LOAN	96.1	100.1	103.4	104.4	106.3	110.3	114.2	118.5	123.5	127.3	130.4	135.9
SAVINGS BANKS	38.3	40.2	41.2	42.3	43.6	44.7	45.5	46.7	47.8	48.6	49.1	49.9
LIFE INSURANCE	37.1	38.4	39.7	40.5	41.2	41.5	41.6	41.8	42.0	42.1	42.4	42.7
COMMERCIAL BANKS	30.4	32.3	33.9	34.8	35.6	37.5	39.2	41.3	43.5	44.9	45.3	45.8
FEDERAL(FNMA)	2.1	2.5	3.7	4.4	4.6	5.5	6.7	7.2	8.3	11.0	13.9	10.4
APPENDA												
FHLBA ADVANCES	5.9	6.0	7.1	6.9	4.6	4.4	5.2	5.3	6.8	9.3	10.7	10.6
MORTGAGE RATE	5.830	5.905	6.230	6.665	6.510	6.580	6.960	7.340	7.735	8.300	8.575	8.525
MORTGAGE STOCK CHANGE(%)	4.09	4.11	3.63	2.17	2.27	3.49	3.32	3.33	3.62	3.22	2.60	3.24
VACANCY RATE (%)	2.68	2.65	2.55	2.38	2.29	2.20	1.92	1.91	1.73	1.77	1.76	1.77

5.10 Long Term Credit Market Instruments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
TOTAL ISSUES	566.0	571.3	583.2	589.3	599.2	613.9	629.8	648.1	658.4	669.5	687.9	713.9
BUSINESS	345.7	351.3	362.1	369.2	379.2	391.9	401.5	411.3	422.2	434.8	449.9	469.7
CORPORATE BONDS	110.1	113.9	120.0	124.9	132.0	140.6	147.0	154.3	161.7	168.0	177.6	190.8
CORPORATE STOCK	183.3	182.9	184.3	184.1	184.8	186.4	186.6	185.6	186.2	189.9	193.0	196.7
COMMERCIAL MORTGAGES	52.3	54.5	57.7	60.1	62.4	64.8	67.9	71.4	74.3	76.9	79.3	82.3
STATE AND LOCAL GOVERNMENTS	91.4	94.8	97.9	99.9	103.0	106.4	110.2	116.3	119.0	121.7	126.5	131.7
FEDERAL GOVERNMENT	59.8	55.2	52.5	49.0	44.7	42.1	43.9	45.1	41.1	36.5	35.0	34.6
HOLDERS												
COMMERCIAL BANKS	68.2	68.9	70.8	69.3	74.3	75.8	81.2	90.4	88.0	83.0	84.8	89.4
SAVINGS AND LOANS	11.8	12.2	12.1	12.1	12.0	12.3	12.9	13.7	13.4	13.3	12.8	13.5
SAVINGS BANKS	12.6	12.5	12.5	12.6	13.9	15.0	16.0	17.1	17.7	18.0	18.7	20.0
LIFE INSURANCE	88.9	91.6	93.9	95.5	98.0	101.5	105.0	108.5	111.3	113.3	116.2	118.6
STATE AND LOCAL GOVERNMENT	9.9	10.6	10.6	11.4	10.8	11.0	11.7	11.4	13.1	12.2	11.4	9.0
FOREIGN	5.7	5.3	5.5	5.6	5.9	6.2	7.0	8.5	9.7	10.5	10.8	11.9
HOUSEHOLDS AND OTHERS	364.2	365.6	373.0	379.0	381.0	386.7	392.2	392.8	399.8	414.0	425.5	443.6

5.11 Short Term Credit Market Instruments

	1965-1	1965-2	1966-1	1966-2	1967-1	1967-2	1968-1	1968-2	1969-1	1969-2	1970-1	1970-2
TOTAL ISSUES	141.9	146.0	153.8	159.5	164.1	179.6	187.2	193.2	203.4	219.7	235.9	243.0
BUSINESS	9.5	9.9	11.0	14.4	16.5	17.9	19.4	22.1	25.6	29.8	32.0	32.5
U.S. GOVERNMENT	124.5	128.1	134.4	136.5	137.8	150.7	156.9	160.1	163.8	171.8	181.4	189.6
STATE AND LOCAL GOVERNMENT	5.2	5.5	5.9	6.2	6.8	8.0	8.1	8.1	9.7	10.7	11.7	14.5
COMMERCIAL BANKS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	4.2	7.5	2.3
FOREIGN SECTOR	2.6	2.6	2.5	2.5	3.0	3.0	2.8	2.8	3.0	3.1	3.3	3.9
HOLDERS												
BUSINESS	25.1	24.9	25.7	22.3	19.5	23.5	26.6	27.4	29.1	27.9	30.1	24.9
STATE AND LOCAL GOVERNMENT	12.1	12.0	13.8	13.6	13.5	16.2	17.3	18.4	20.0	24.7	25.3	25.6
FOREIGN	14.9	15.1	14.3	13.0	14.2	15.1	13.3	15.2	13.6	14.4	18.1	24.0
COMMERCIAL BANKS	54.3	56.5	56.9	58.7	66.1	75.6	73.9	74.8	73.6	75.2	78.9	92.8
SAVINGS AND LOAN	4.8	5.0	5.2	5.9	7.5	8.3	8.8	8.6	9.4	9.5	10.9	12.7
SAVINGS BANKS	3.0	3.0	3.1	3.2	3.2	3.4	3.8	3.5	3.8	3.5	3.7	3.9
LIFE INSURANCE	1.2	1.1	0.9	1.2	1.5	1.3	1.4	1.6	1.6	2.4	2.7	3.4
HOUSEHOLDS AND OTHERS	26.5	29.7	35.0	41.4	38.0	37.8	42.5	45.6	53.1	63.1	69.0	56.3

APPENDIX B

The following equation listing is presented in two parts: the financial sector and the real sector. Within the financial sector the equations are grouped by major behavioral sectors. The variable nomenclature represents an attempt to follow a mnemonic system. The first set of symbols is based on the name of the financial instrument in question. This is followed by an "L" for variables which are liabilities for the sector in question. The final set of symbols identify the specific sector. For example, LCMILB is Long-term Credit Market Liabilities of Business. A list of variable definitions is given at the end of each major section.

All flow variables, principally those of the national income accounts, are measured at annual rates. First differences are indicated by " Δ ". Percentage changes are represented by " $\Delta\%$ ".

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TABLE I
SOURCES AND USES OF FUNDS BY SECTOR
(LINKING THE REAL AND FINANCIAL SECTORS)

Business Sector Deficit		30.4
Gross domestic investment ¹	117.5	
Direct foreign investment ²	3.6	
less: Retained earnings	15.4	
Foreign branch profits ²	2.3	
Inventory valuation adjustment	-4.4	
Capital consumption allowances ¹	77.4	
 Federal Government Deficit		 12.9
Total expenditures	204.5	
less: Total revenue	191.6	
 State and Local Deficit³		 3.9
Total expenditures	132.1	
Retirement credit to households	6.8	
less: Total revenue	135.0	
 Foreign Deficit		 -9
Exports	62.9	
Foreign branch profits ²	2.3	
less: Imports	59.3	
Transfers from U.S.	3.2	
Direct foreign investment	3.6	
 Household Surplus⁴		 51.0
Disposable income	689.5	
Retirement credit from S & L governments	6.8	
Capital consumption allowances	9.0	
less: Personal outlays	634.7	
Residential home purchases	19.6	
 Statistical Discrepancy (NIA)		 -4.7

¹Excludes component of residential investment and depreciation attributed to household sector.

²Included herein but not in NIA definitions.

³Differs from NIA definitions by inclusion of pension fund payments to established funds as an expenditure.

⁴See footnotes (1) and (3).

Sources: Tables 4, 6, 10, 12, 13, and 14 of National Income and Product tables, *Survey of Current Business*, April, 1972; and Table 1 of Flow of Funds, 4th Quarter 1971.

TABLE II
Financial Portfolio by Sector

1. Business

Assets	Liabilities
Cumulative Income Deficit	Short-Term Loans
Liquid Assets	Bank Loans
Time Deposits	Short-Term Credit Market Instruments
Money Balances	Long-Term Credit Market Instruments
Short-Term Credit Market Instruments	Corporate Bonds
Consumer Credit	Commercial Mortgages
	Corporate Stock
	Unpaid Tax Liabilities
	Residential Mortgages
	Residential Liabilities

2. Federal Government

Assets	Liabilities
Cumulative Income Deficit	Currency
Unpaid Tax Liabilities	Unborrowed Reserves
FHBB Advances	Short-Term Credit Market Instruments
FNMA Mortgage Assets	Long-Term Credit Market Instruments
Other Mortgage Assets	Residual Liabilities
Loans to Foreigners	
Official Reserve Assets	

3. State and Local Governments

Assets	Liabilities
Cumulative Income Deficit	Short-Term Debt
Unpaid Tax Liabilities	Long-Term Debt
Financial Assets	Residual Liabilities
Time Deposits	
Short-Term Credit Market Instruments	
Long-Term Credit Market Instruments	

4. Foreign Sector

Assets	Liabilities
Cumulative Income Deficit	Short-Term Credit Market Instruments
Time Deposits	Long-Term Credit Market Instruments
Short-Term Credit Market Instruments	U.S. Gov't Loans to Foreigners
Long-Term Credit Market Instruments	U.S. Official Reserve Assets
Eurodollar Loans to U.S. Banks	Residual Liabilities

5. Households and Residual Sectors
Assets

Time Deposits
Savings and Loan Deposits
Savings Bank Deposits
Life Insurance Reserves
Short-Term Credit Market Instruments
Long-Term Credit Market Instruments
Residual Assets

Liabilities

Cumulative Income Surplus
Residential Mortgages
Consumer Credit

6. Commercial Banking
Assets

Unborrowed Reserves
Free Reserves
Bank Loans
Residential Mortgages
Consumer Credit
Short-Term Market Instruments
Long-Term Market Instruments
Residual Assets

Liabilities

Time Deposits
Demand Deposits
Eurodollar Loans
Short-Term Credit Market Instruments
Long-Term Credit Market Instruments

7. Nonbank Intermediaries
Assets

Residential Mortgages
Short-Term Credit Market Instruments
Long-Term Credit Market Instruments
Residual Assets

Liabilities

Deposits
FHLBB Advances

A. Business Sector

A1 External Financing Deficit

$$\text{DEF*B} = \text{IFIXER} + \text{ICRB} + \text{INV} + \text{IDFOR} - \text{RE} - \text{CCAB} - \text{IVA} - \text{ZBFOR} \\ + 2.0 (\text{CCB} - \text{CCB}_{-1})$$

A2 Cumulative Business Deficit

$$\text{KDEFB} = \text{KDEFB}_{-1} + .5 \cdot \text{DEFB}, \\ \text{or} \\ \text{KDEFB} = \text{BCPLB} + \text{SLB} + \text{MTGC} + \text{STKLB} + \text{MTGRLB} + \text{TCXLB} - \text{LAB} + \text{JKLB}$$

A3 Short-term Debt

$$\Delta\text{SLB} = .328 (\text{DEFB} - 2 \cdot \Delta\text{MTGC}) - .523\Delta\text{TCXLB} + .0032(\text{RG3M} - \text{RG3M}_{-2}) \cdot \text{KDEFB} \\ (6.7) \quad (4.3) \quad (4.5) \\ + .716 \text{STKRET} - .237 \text{SLB}_{-1} + .161 \text{BCPLB}_{-1} + .112 \text{MTGC}_{-1} \\ (6.6) \quad (5.3) \quad (3.8) \quad (2.2) \\ - 4.343 \text{DMY7002} - 3.532 \\ (4.5) \quad (3.1) \quad R^2 = .96 \\ SE = .80$$

A4 Corporate Bonds

$$\Delta\text{BCPLB} = [-.0025 (\text{RG3M} - \text{RG3M}_{-2}) + .0010 \text{TIME}] \cdot \text{KDEFB} + .176 \text{STKRET} \\ (6.9) \quad (6.5) \quad (2.8) \\ - .274 \text{BCPLB}_{-1} + .105 (\text{SLB} - \text{LAB})_{-2} + 13.704 \\ (8.0) \quad (5.4) \quad (10.1) \quad R^2 = .98 \\ SE = .49$$

A5 Corporate Stock

a. New Issues

$$\text{STKIB} = [.019 - .0036\text{RDP} + .0022 \text{RBAA}] \cdot \text{KDEFB} - .162 \text{STKLB}_{-1} \\ (3.6) \quad (4.0) \quad (5.2) \quad (7.4) \\ + 1.067 \text{DMYSTKIB} + 26.840 \\ (7.2) \quad (7.4) \quad R^2 = .96 \\ SE = .28$$

b. Net Change in Outstandings

$$\Delta\text{STKLB} = \text{STKIB} - \text{STKRET}$$

A6 Commercial Mortgage Liabilities

$$\Delta\text{MTGC} = [.020 - .0014 \text{RBAA} + .0011 \text{RBAA}_{-4}] \cdot \frac{(\text{GNP} + \text{GNP}_{-1})}{2} \\ (3.4) \quad (7.4) \quad (8.2) \\ + .052 (\text{SLB} - \text{LAB})_{-2} + .087 \text{TIME} - .256 \text{MTGC}_{-2} - 4.562 \\ (4.0) \quad (2.2) \quad (3.2) \quad (2.1) \\ R^2 = .93 \\ SE = .28$$

A7 Liquid Assets

$$\text{RES} = \text{KDEFB} - \text{SLB} - \text{BCPLB} - \text{MTGC} - \text{STKIB} - \text{TCXLB} \\ \Delta\text{LAB} = -.820\Delta\text{RES} - .055 \text{RES}_{-1} - .512 \text{LAB}_{-1} + [.0043 \text{RG3M} - .0029 \text{RBAA}] \cdot \text{KDEFB} \\ (7.8) \quad (2.5) \quad (4.4) \quad (2.9) \quad (3.0) \\ + 15.246 \\ (4.2) \quad R^2 = .81 \\ SE = 1.32$$

A8 *Components of Short-term Debt*

a. Open Market Paper

$$\Delta\text{OMPLB} = \left[\underset{(5.0)}{.015} \text{RMALB} - \underset{(2.6)}{.0081} \frac{\text{RG3M} + \text{RG3M}_{-1}}{2} + \underset{(4.5)}{.053} \right] \cdot \text{SLB}$$

$$- \underset{(10.2)}{.519} \text{OMPLB}_{-1} - \underset{(5.6)}{2.716}$$

$R^2 = .86$
SE = .51

b. Bank Loans

$$\text{BLB} = \text{SLB} - \text{OMPLB}$$

A9 *Components of Liquid Assets*

a. Time Deposits

$$\text{TDB} = \left[\underset{(3.6)}{-0.264} + \underset{(4.6)}{.023} \frac{\text{RCD} + \text{RCD}_{-1}}{2} - \underset{(5.2)}{.021} \frac{\text{RG3M} + \text{RG3M}_{-1}}{2} \right] \cdot \frac{\text{LAB} + \text{LAB}_{-1}}{2}$$

$$+ \underset{(5.1)}{.348} \text{DMYTDB} + \underset{(4.5)}{10.220}$$

$R^2 = .95$
SE = .48

b. Short-term Market Instruments

$$\text{SCMIB} = \left[\underset{(4.0)}{-0.027} \frac{\text{RCD} + \text{RCD}_{-1}}{2} + \underset{(6.1)}{.031} \frac{\text{RG3M} + \text{RG3M}_{-1}}{2} \right] \cdot \frac{\text{LAB} + \text{LAB}_{-1}}{2}$$

$$+ \underset{(11.8)}{.704} \text{LAB} - \underset{(5.0)}{.020} \text{SF} - \underset{(4.3)}{10.919}$$

$R^2 = .95$
SE = .70

c. Money Holdings

$$\text{MDB} = \text{LAB} - \text{TDB} - \text{SCMIB}$$

BCPLB	= Corporate bond liability
CCAB	= Capital consumption allowances
DEFB	= External deficit
DMY7002	= Penn Central crisis
DMYSTKJB	= Dummy for large single stock issue
DMYTDB	= Trend adjustment for introduction of certificates of deposit
ICRB	= Residential investment
IDFOR	= Foreign direct investment
IFIXER	= Fixed investment except residential
INV	= Inventory accumulation
IVA	= Inventory valuation adjustment
JKLB	= Unallocated liabilities and statistical discrepancy
KDEFB	= Cumulative deficit
LAB	= Liquid asset holdings
MDB	= Money balances
MTGC	= Commercial mortgages
RBAA	= Corporate bond yield
RCD	= Certificate of deposit rate
RDP	= Dividend/price yield
RG3M	= Three month treasury bill rate
SCMIB	= Short-term market assets
SF	= Final sales
SLB	= Short-term debt

STKIB	= Corporate stock issues
STKRET	= Corporate stock retirements
TDB	= Time deposits
TIME	= Trend: 1959: 1 = 1.0
TCXLB	= Unpaid tax liabilities
ZBFOR	= Foreign branch profits

B. Federal Government

(Includes General Government, Agencies, and Federal Reserve)

B1 Cumulative Federal Deficit

$$KDEFGF = KDEFGF_{-1} + .5 (EXPENGF - TGF)$$

B2 Short-term Federal Debt¹ (Under 5 years)

$$SCMILGF = KDEFGF + TCXGF + MTGRGF + FNMA + FHLBA + LUSFOR + ORAFG - UBR \\ - CURR - LCMILGF - JKLGF$$

¹Endogenous variables include KDEFGF, TCXGF, FHLBA, and CURR

DEFINITIONS:

CURR	= Currency component of money supply
EXPENGF	= Federal Government expenditures
FHLBA	= Federal Home Loan Bond advances
FNMA	= Mortgage assets of Federal National Mortgage Association
JKLGF	= Net miscellaneous liabilities — federal government
KDEFGF	= Cumulative net financial liability — federal government
LCMILGF	= Long-term credit market liabilities — federal government
LUSFOR	= U.S. government loans to foreigners
MTGRGF	= Federal government mortgage assets
ORAGF	= U.S. official reserve assets
SMCILGF	= Short-term credit market liabilities — federal government
TCXGF	= Unpaid tax liabilities
TGF	= Federal government receipts
UBR	= Unborrowed reserves

C. State and Local Governments

C1 Cumulative Financing Deficit

$$KDEFGSL = KDEFGSL_{-1} + .5 (EXPENGS� - TCGSL) + \Delta PFGSL$$

C2 Long-term Borrowing

$$\Delta BGSL1 + = [-.078 + .0031 \text{ TIME} - .012 (\text{RGSL} - \text{RGSL}_{-2})] \cdot \text{KDEFGSL} \\ (.9) \quad (3.6) \quad (6.6) \\ + \Delta BGSL1 -_{-2} - .213 \text{ BGSL1} +_{-1} + 8.733 \\ (4.2) \quad (1.8) \quad R^2 = .82 \\ SE = .49$$

C3 Short-term Borrowing

$$\Delta BGSL1 - = .138 \Delta \text{KDEFGSL} + [-.157 + .0012 \text{ TIME} + .0072 (\text{RGSL} - \text{RG3M})] \cdot \text{KDEFGSL} \\ (1.4) \quad (2.2) \quad (3.0) \quad (5.5) \\ -.394 \text{ BGSL1} -_{-2} + 5.957 \\ (2.2) \quad (1.8) \quad R^2 = .80 \\ SE = .37$$

C4 *Financial Assets*

$$FASGSL = -KDEFGSL + BGS1+ + BGS1- - TCXGSL + JKLGSL$$

C5 *Distribution of Financial Assets*

a. *Time Deposits*

$$TDGSL = [1.000 - .0043 \text{ TIME} + .052 \text{ RCD} - .060 \text{ RG3M}] \cdot FASGSL$$

(5.5)	(3.0)	(10.4)	(15.8)	
				$R^2 = .998$
				$SE = .37$

b. *Short-term marketable securities*

$$SCMIGSL = [-1.218 + .018 \text{ TIME} - .043 \text{ RCD} + .039 \text{ RG3M}] \cdot FASGSL$$

(3.4)	(7.8)	(5.3)	(4.8)	
				$R^2 = .996$
				$SE = .583$

c. *Long-term marketable securities*

$$LCMIGSL = FASGSL - SCMIGSL - TDGSL$$

DEFINITIONS:

BGS1+	=	Long-term state and local bond liabilities
BGS1-	=	Short-term state and local liabilities
FASGSL	=	State and local financial assets
KDEFGSL	=	Cumulative financial deficit
LCMIGSL	=	Long-term credit market assets
RBAA	=	Corporate bond rate
RCD	=	Large certificate of deposit
RGSL	=	State and local bond rate
RG3M	=	3 month bill rate
SCMIGSL	=	Liquid credit market assets
TDGSL	=	Time deposits — state and local governments
EXPENGSL	=	State and local government expenditures
JKLGSL	=	Residual liabilities of state and local governments
TCXGSL	=	Unpaid corporate tax liabilities

D. *Foreign Sector*

D1 *Cumulative Financial Deficit*

$$KDEFFOR = KDEFFOR_{-1} + EX - M + ZBFOR - IDFOR - VFORPER - VFORGF$$

D2 *Foreign Time Deposits*

$$TDFOR = .495 \text{ RCD} - .542 \text{ RG3m} + .795 \text{ DMYTDFOR} - .873 \text{ TDFOR} + 1.041$$

(1.6)	(2.8)	(7.9)	(5.5)	(4.3)
				$R^2 = .98$
				$SE = .28$

D3 *Short-term Credit Market Assets*

$$SCMIFOR = -DEFFOR - TDFOR - EDCB - LCMIFOR + LCMILFOR + OMPLFOR + LUSFOR + ORAGF + JKLFOR$$

DEFINITIONS:

DMYTDFOR = Dummy variable for change in time deposits of foreign official institutions, 1969-70

EDCB = Eurodollar loans to U.S. banks

IDFOR = Foreign direct investment

JKLFOR = Net Miscellaneous liabilities – foreign

KDEFFOR = Net financial liabilities – foreign

LCMIFOR = Long-term credit market assets – foreign

LCMILFOR = Long-term credit market liabilities – foreign

LUSFOR = U.S. government loans to foreigners

OMPLFOR = Open market paper liabilities – foreign

ORAGF = U.S. official reserve assets

PBFOR = Foreign branch profits

RCD = Certificate of deposit rate

RG3M = Three-month Treasury bill rate

SCMIFOR = Short-term credit market assets – foreign

TDFOR = Time deposits – foreign

VFORGF = Federal transfers to foreigners

VFORPER = Personal transfers to foreigners

ZBFOR = Foreign branch profits

E. Household Sector

E1 Net Accumulation of Financial Assets

$$NAFA = PSAV - ICRH + CCAH + (\Delta MTGRLH + \Delta CCCH + \Delta PFGSL) \cdot 2.0$$

E2 Household Financial Assets

$$KNAFA = KNAFA_{-1} + .5 NAFA + \Delta CG$$

E3 Savings and Loan Deposits

$$\begin{aligned} \Delta SL = & .126 NAFA + .001 [73.03 + .8 RSL - .435 TIME + 4.450 (RSL - RTDH) \\ & (2.4) \qquad (2.0) \text{ (constr)} \quad (1.7) \qquad (3.7) \\ & + 2.204 (RSL - RG35)] \cdot KNAFA_{-1} - .218 SL_{-1} - 30.999 \\ & (10.9) \qquad (3.2) \qquad (2.0) \\ & R^2 = \\ & SE = .74 \end{aligned}$$

E4 Savings Bank Deposits

$$\begin{aligned} \Delta SB = & .025 NAFA + .001 [29.615 + .400 RSB - .169 TIME \\ & \text{(constr)} \qquad (3.2) \text{ (constr)} \quad (2.8) \\ & + .766 (RSB - RTDH) + .592 (RSB - RG35)] \cdot KNAFA_{-1} \\ & (1.7) \qquad (8.1) \\ & - .229 SB_{-1} - 9.075 \\ & (2.8) \qquad (2.4) \\ & R^2 = \\ & SE = .31 \end{aligned}$$

E5 Time Deposits

$$\begin{aligned} \Delta TDH = & .145 NAFA + .001 [.393 TIME + .766 (RTDH - RSB) \\ & (2.0) \qquad (6.3) \qquad \text{(constr)} \\ & + 4.450 (RTDH - RSL) + 2.355 (RTDH - RG35) + .8RTDH \\ & \text{(constr)} \qquad (4.5) \qquad \text{(constr)} \\ & + 1.95 (RCD - RG3M)] \cdot KNAFA_{-1} - .470 TDH_{-1} + 12.714 \\ & (3.2) \qquad (8.8) \qquad (10.6) \\ & R^2 = .93 \\ & SE = 1.34 \end{aligned}$$

E6 *Life Insurance Reserves* (minus policy loans)

$$\begin{aligned} \Delta LI = & .052 \text{ NAFA} + .001 [67.212 - .359 \text{ TIME} - .212 \text{ RG35}] \cdot \text{KNAFA}_{-1} \\ & (2.6) \qquad (2.6) \qquad (4.9) \\ & - .356 \text{ LI}_{-1} - 3.692 \\ & (2.6) \qquad (1.9) \qquad R^2 = .96 \\ & \qquad \qquad \qquad \qquad \qquad \qquad \text{SE} = .15 \end{aligned}$$

E7 *Consumer Credit Liabilities*

$$\begin{aligned} \Delta \text{CCH} = & .450 \text{ CD} + .236 \Delta \text{CD}_{-1} + .318 \text{ TIME} - .531 \text{ CCH}_{-1} - 14.913 \\ & (10.4) \qquad (3.6) \qquad (8.5) \qquad (10.6) \qquad (10.0) \\ & \qquad \qquad \qquad \qquad \qquad \qquad R^2 = .93 \\ & \qquad \qquad \qquad \qquad \qquad \qquad \text{SE} = .58 \end{aligned}$$

E8 *Residential Mortgage Liabilities*

$$\text{MTGRLH} = \text{PMTGRH} \cdot \text{MTGR}$$

DEFINITIONS:

CCAH	= Capital consumption allowance on residential housing
CCH	= Consumer credit liabilities
CD	= Consumer durable good expenditures
CG	= Capital gains (trend)
ICRH	= Residential construction expenditures of households
KNAFA	= Total financial wealth
LI	= Life insurance reserves less policy loans
MTGRLH	= Residential mortgage liabilities
NAFA	= Net accumulation of financial assets
PFGSL	= State and local government pension fund reserves
PSAV	= Personal savings
RCD	= Rate on large certificates of deposit
RG35	= 3-5 year Treasury-Bond Rate
RSB	= Savings bank deposit rate
RSL	= Savings and loan deposit rate
RTDH	= Household time deposit rate
SB	= Savings bank deposits
SL	= Savings and loan deposits
TDH	= Household time deposits
TIME	= Trend, quarterly, 194601 = 1.0
YD	= Disposable personal income

F. *Commercial Banks*

F1 *Time Deposits*

a. Total

$$\text{TDCB} = \text{TDH} + \text{TDB} + \text{TDGSL} + \text{TDFOR}$$

b. *Member Banks*

$$\text{TDFRB} = \text{PTD} \cdot \text{TDCB}$$

F2 *Required Reserves*

$$\text{RR} = \text{UBR} - \text{FR}$$

F3 *Demand Deposits*

a. Member Bank

$$\text{DDFRB} = (\text{RR} - \text{ZTD} \cdot \text{TDFRB}) / \text{ZDD}$$

b. Total (money supply definition)

$$DDCB = (DDFRB - DDGFFRB)/PDD$$

F4 *Bank Earning Assets* (balance sheet constraint)

$$EACB = DDCB + TDCB + EDCB + OMPLCB - RR$$

F5 *Consumer Credit Assets*

$$\begin{aligned} \Delta CCB = & .592 \Delta CCH + .171 RBAA_{-1} - .019 \Delta LNEXCB_{-1} \\ & (15.2) \quad (2.2) \quad (2.9) \\ & - .013 TIME - .269 \\ & (1.7) \quad (1.1) \end{aligned} \quad \begin{aligned} R^2 = & .95 \\ SE = & .31 \end{aligned}$$

F6 *Residential Mortgage Assets*

$$\begin{aligned} \Delta MTGRCB = & [.029 + .00087(RMC - RBAA)_{-1} - .023 RLNEXCB_{-1}] \\ & (3.5) \quad (2.0) \quad (3.3) \\ & \cdot EACB_{-1} + .140 BGSLCB_{-1} - .297 MTGRCB_{-1} + .622 \\ & (5.7) \quad (3.6) \end{aligned} \quad \begin{aligned} R^2 = & .96 \\ SE = & .18 \end{aligned}$$

F7 *Excess Loan Demand* (member banks)

Levels version

$$LNEXCB = [.8 (BLB + CCCB + MTGRCB)] - \left[\frac{(1 - ZDD) \cdot UBR - ZTD \cdot TDFRB}{ZDD} + TDFRB \right]$$

Ratio version

$$\frac{.8 (BLB + CCCB + MTGRCB)}{(1 - ZDD) \cdot UBR - ZTD \cdot TDFRB + TDFRB} \cdot ZDD$$

F8 *Free Reserves*

$$\begin{aligned} \frac{FR}{ZDD} = & -.202 \Delta LNEXCB + .086 \Delta LNEXCB_{-1} + .357 \Delta (EDCB + OMPLCB) \\ & (5.5) \quad FR \quad (2.5) \quad (3.6) \\ & + .472 (ZDD)_{-1} - .608 FRNEG_{-1} + [-.187 + .0015 TIME - .016 RG3M] \\ & (3.2) \quad (2.7) \quad (2.0) \quad (3.6) \quad (5.1) \\ & \cdot \frac{(DDFRB + DDFRB_{-1})}{2} + 15.030 \\ & (2.0) \end{aligned}$$

$$\begin{aligned} R^2 = & .93 \\ SE = & .80 \end{aligned}$$

$$FRNEG = \left(\frac{FR}{ZND} - \text{ABS} \left(\frac{FR}{ZDD} \right) \right) / 2.0$$

F9 *U.S. Government Long-Term Bonds*

$$\begin{aligned} \Delta BUS5+CB = & .522 \Delta BUS5+GF + .059 EACB + [.115 - .0014 TIME_{-1}] \cdot EACB_{-1} \\ & (12.8) \quad (1.9) \quad (2.1) \quad (4.1) \\ & - .129 BUS5+CB_{-1} - 14.275 \\ & (3.0) \quad (3.5) \end{aligned} \quad \begin{aligned} R^2 = & .93 \\ SE = & .70 \end{aligned}$$

F10 *State and Local Government Securities*

$$\begin{aligned} \Delta \text{BGS LCB} = & .148 \text{ EACB} - .112 \Delta \text{LNEXCB} - .087 (\text{MTGR CB}_{-1} + \text{CCCB}_{-1} + \text{BLB}_{-1}) \\ & (6.7) \quad (7.4) \quad (5.2) \\ & - .326 \text{ BGS LCB}_{-1} - 10.793 \\ & (3.8) \quad (5.9) \end{aligned}$$

$R^2 = .93$
SE = .62

F11 *Other Long-Term Securities*

$$\begin{aligned} \Delta \text{OLCMICB} = & .020 \text{ EACB} - .015 \Delta \text{LNEXCB} + [.021 - .016 \text{RLNEXCB}_{-1}] \\ & (2.1) \quad (2.6) \quad (1.6) \quad (3.4) \\ & + .258 \text{OLCMICB}_{-1} - 3.127 \\ & (2.2) \quad (4.6) \end{aligned}$$

$R^2 = .94$
SE = .14

F12 *Short-Term Credit Market Assets*

$$\begin{aligned} \text{SCMICB} = & \text{EACB} - \text{BLB} - \text{CCCB} - \text{MTGR CB} - \text{FR} - \text{BGS LCB} - \text{BUS5+CB} \\ & - \text{OLCMICB} + \text{LCMILCB} - \text{JKACB} \end{aligned}$$

F13 *Eurodollar Loans*

$$\begin{aligned} \text{EDCB} = & -.360 \text{ TDCB} + .064 \Delta \text{LNEXCB} + 2.380 \text{ TIME} - 6.695 \text{ DMYEDCB} - 133.406 \\ & (13.7) \quad (2.9) \quad (14.2) \quad (6.2) \quad (12.8) \end{aligned}$$

$R^2 = .98$
SE = .76

F14 *Negotiable Certificate of Deposit Rate*

Desired rate

$$\begin{aligned} \text{RCD}^* = & .943 \text{ RG3M} + 4.118 \text{RLNEXCB}_{-1} - 1.782 \\ & (17.6) \quad (6.2) \quad (6.2) \end{aligned}$$

$R^2 = \text{N.A.}$
SE = .12

Actual rate

$$\begin{aligned} \text{RCD} = \text{RCD}^* & , \quad \text{RCD}^* \leq \text{CRCD} \\ \text{RCD} = \text{CRCD} & , \quad \text{RCD}^* > \text{CRCD} \end{aligned}$$

F15 *Household Time Deposit Rate*

$$\begin{aligned} \Delta \text{RTDH} = & .046 (\text{CRTDH} - \text{RTDH}_{-1}) \cdot (\text{RBAA} - \text{RTDH}_{-1}) + .290 \text{RLNEXCB}_{-1} \\ & (5.9) \quad (1.5) \\ & + .058 \Delta \text{RBAA} + .463 \Delta \text{CRTDH} - .182 \text{DMYRTDH} - .025 \\ & (2.7) \quad (8.2) \quad (6.7) \quad (2.3) \end{aligned}$$

$R^2 = .97$
SE = .03

F16 *Bank Loan Rate*

$$\begin{aligned} \text{RMALB} = & .509 \text{ RBAA} + 2.079 \text{RLNEXCB} + 6.077 \text{RLNEXCB}_{-1} + .219 \Delta \text{RDIS} \\ & (12.2) \quad (1.8) \quad (4.7) \quad (3.2) \\ & + .358 \text{DMYRMALB} \cdot (\text{RG3M} - \text{CRCD}) - 2.080 \\ & (12.1) \quad (8.7) \end{aligned}$$

$R^2 = .99$
SE = .13

DEFINITIONS:

BLB	Bank loans to business
BGSLCB	State and local government securities
BUS5 + CB	U.S. bonds over 5 years – commercial banks
BUS5 + GF	U.S. bonds over 5 years – total
CCCB	Consumer credit assets – banks
CCH	Consumer Credit Liabilities – Households
CRCD	Ceiling rate on RCD
CRTD	Ceiling rate on RTOH
CURR	Currency component of money supply
DDCB	Demand deposit component of money supply
DDGFFRB	Federal government deposits
DDFRB	Member bank demand deposits
DMYCD	Dummy variable for introductions of CDs
DMYEDCB	Dummy variable for introduction of reserve requirement on Eurodollar loans
DMYRTDH	Dummy variable for ceiling rate change and introduction of small certificates in 1966
DMYRMALB	1.0 after 1962 for introduction of negotiable certificates of deposit
EACB	Total bank earning assets
EDCB	Eurodollar loans
FR	Free reserves
JKACB	Residual assets -- commercial banks
LNEXCB	Excess loan demand level
MTGRCB	Residential mortgages
MD	Money supply
OLCMICB	Other marketable securities
OMPLCBL	Open market paper liabilities
PDD	Ratio of member bank demand deposits to total
PTDL	Ratio of member bank time deposits to total
RBAAL	Corporate bond rate
RCDL	Large certificate of deposit rate
RDIS	Discount rate
RG3M	Treasury bill rate
RLNEXCB	Excess loan demand (ratio)
RMALB	Bank loan rate
RMC	Conventional mortgage rate
RR	Required reserves
RTDH	Household time deposit rate
SCMICB	Short-term marketable securities – commercial banks
TDB	Business time deposits
TDCB	Time deposits – total
TDFOR	Foreign time deposits
TDFRB	Member bank time deposits
TDGSL	Saving and loan government time deposits
TDH	Household time deposits
TIME	Time trend 194601 = 1
UBR	Unborrowed reserves
ZDD	Reserve required on demand deposits
ZTD	Reserve requirement on time deposits

G. Nonbank Financial Intermediaries

G1 Residential Mortgage Assets

a. Savings and loan associations

$$\begin{aligned} \Delta MTGRSL = & (.637 + .096 \Delta RMC) \cdot \Delta SL + .658 \Delta FHLBA \\ & (15.8) \quad (3.1) \qquad (5.8) \\ & + (.220 + .011 RMC - .005 RBAA) \cdot SL_{-1} - .289 MTGRSL_{-2} \\ & (6.5) \quad (2.1) \qquad (1.7) \qquad (5.5) \\ & + .078 \\ & (4) \end{aligned}$$

$R^2 = .99$
SE = .22

where

$$\begin{aligned} FHLBA = & -.429 \Delta SL + .256 \Delta SL_{-1} + .22 \Delta MTGRSL_{-1} - .009 (RFHLB_{-1} - RMC_{-1}) \\ & (10.4) \quad (4.2) \quad (2.4) \qquad (3.4) \\ & + (-.482 + .0004 TIME_{-2}) \cdot SL_{-2} + .517 MTGRSL_{-2} \\ & (4.6) \quad (2.4) \qquad (3.9) \\ & - .562 FHLBA_{-2} - .091 \\ & (3.3) \quad (2) \end{aligned}$$

$R^2 = .92$
SE = .90

b. Mutual savings banks

$$\begin{aligned} \Delta MTGRSB = & .486 \Delta SB + .011 (RMC - RBAA) \cdot SB \\ & (9.) \qquad (3.6) \\ & + .015 (RMC_{-1} - RBAA_{-1}) \cdot SB_{-1} + .168 SB_{-1} \\ & (3.1) \qquad (4.9) \\ & - .201 MTGRSB_{-2} - 1.763 \\ & (5.0) \qquad (3.4) \end{aligned}$$

$R^2 = .86$
SE = .17

c. Life insurance companies

$$\begin{aligned} \Delta MTGRLI = & .387 (\Delta LI + \Delta LI_{-1}) / 2.0 + .0087 (RMC_{-1} - RBAA_{-1}) \cdot LI_{-1} \\ & (3.3) \qquad (5.2) \\ & + .063 LI_{-1} + .0053 (RMC_{-2} - RBAA_{-2}) \cdot LI_{-2} \\ & (4.3) \qquad (2.7) \\ & - .195 MTGRLI_{-2} - 1.695 \\ & (4.7) \qquad (4.6) \end{aligned}$$

$R^2 = .88$
SE = .20

G2 Short-Term Credit Market Assets

a. Savings and loan associations

$$\begin{aligned} \Delta SCMISL = & .579 \Delta (SL + FHLBA - MTGRSL) \\ & (11.3) \\ & + (-.092 - .044 RBAA_{-1} + .112 XRG3M_{-1}) \cdot \\ & (3.3) \quad (constr) \qquad (10.4) \\ & (SL_{-1} + FHLBA_{-1} - MTGRSL_{-1}) - .237 SCMISL_{-1} + .860 \\ & (2.9) \qquad (3.9) \end{aligned}$$

$R^2 = .99$
SE = .25

b. Mutual savings banks

$$\begin{aligned} \Delta \text{SMISB} &= .123 \Delta(\text{SB} - \text{MTGRSB}) + (.094 - .024 \text{RBAA}_{-1} + .033 \text{XRG3M}_{-1}) \cdot \\ &\quad (2.2) \qquad (1.5) \quad (3.0) \qquad (3.1) \\ &\quad (\text{SB}_{-1} - \text{MTGRSB}_{-1}) - .684 \text{SCMISB}_{-1} + 1.164 \\ &\qquad (3.9) \qquad (2.1) \end{aligned}$$

$R^2 = .49$
SE = .14

c. Life insurance

$$\begin{aligned} \Delta \text{SCMILI} &= .464 \Delta(\text{LI} - \text{MTGRLI}) - .411 \Delta(\text{LI}_{-1} - \text{MTGRLI}_{-1}) \\ &\quad (4.5) \qquad (3.7) \\ &\quad + (.193 + .0011 \text{RG3M}) \cdot (\text{LI} - \text{MTGRLI}_{-1}) - .124 \text{LI}_{-1} \\ &\quad (3.1) \quad (1.8) \qquad (3.3) \\ &\quad - .700 \text{SCMILI}_{-1} - .388 \\ &\quad (3.7) \qquad (.9) \end{aligned}$$

$R^2 = .69$
SE = .20

G3 Long-Term Credit Market Assets

a. Savings and loan associations

$$\begin{aligned} \Delta \text{LCMISL} &= .222 \Delta(\text{SL} + \text{FHLBA} - \text{MTGRSL}) \\ &\quad (4.4) \\ &\quad + (.366 + .044 \text{RBAA}_{-1} - .087 \text{XRG3M}_{-1}) \cdot \\ &\quad (5.7) \quad (3.8) \qquad (5.2) \\ &\quad (\text{SL}_{-1} + \text{FHLBA}_{-1} - \text{MTGRSL}_{-1}) - .349 \text{LCMISL}_{-1} - .812 \\ &\qquad (5.1) \qquad (5.6) \end{aligned}$$

$R^2 = .89$
SE = .20

b. Mutual savings banks (Full Adjustment)

$$\begin{aligned} \text{LCMISB} &= .633 \Delta(\text{SB} - \text{MTGRSB}) - .027 \text{SB}_{-1} \\ &\quad (9.7) \qquad (1.9) \\ &\quad + (.754 + .026 \text{RBAA}_{-1} - .033 \text{XRG3M}_{-1}) \cdot (\text{SB}_{-1} - \text{MTGRSB}_{-1}) \\ &\quad (10.8) \quad (1.9) \qquad (1.6) \\ &\quad + 1.321 \\ &\quad (2.3) \end{aligned}$$

$R^2 = .999$
SE = .15

c. Life insurance companies

$$\begin{aligned} \Delta \text{LCMILI} &= .544 \Delta(\text{LI} - \text{MTGRLI}) + .316 \Delta(\text{LI}_{-1} - \text{MTGRLI}_{-1}) \\ &\quad (4.5) \qquad (2.2) \\ &\quad + .184 \text{LI}_{-1} + (.483 - .0029 \text{RG3M}_{-1}) \cdot (\text{LI}_{-1}) - \text{MTGRLI}_{-1} \\ &\quad (3.1) \qquad (3.6) \quad (3.7) \\ &\quad - 3.456 \\ &\quad (3.7) \end{aligned}$$

$R^2 = .96$
SE = .26

G4 *Savings and Loan Deposit Rate*

a. Pre-1966 (before ceiling rate imposed)

$$\begin{aligned} \text{RSL} = & .598 \text{ RESL} + 1.55 \text{ RMC} + .089 \text{ CRTDH} + 2.813 \text{ MTGRSL}_{-1}/\text{SL}_{-1} \\ & (4.6) \quad (4.5) \quad (4.8) \quad (2.7) \\ & + .457 \text{ RSL}_{-1} - 4.862 \\ & (5.1) \quad (4.5) \end{aligned}$$

$$\begin{aligned} R^2 &= .997 \\ SE &= .028 \end{aligned}$$

b. Post-1966 (ceiling rate period)

$$\Delta \text{RSL} = .258 (\text{CRSL} - \text{RSL}_{-1}) \cdot (\text{RMC} - \text{RSL}_{-1}) + .215 \Delta \text{PCDSL} - .019$$

(24.5) (2.3) (1.8)

$$\text{RSL} \leq \text{CRSL}$$

$$\begin{aligned} R^2 &= .99 \\ SE &= .022 \end{aligned}$$

G5 *Mutual Savings Bank Deposit Rate*

a. Pre-1966 (before ceiling rate imposed)

$$\begin{aligned} \text{RSB} = & .205 \text{ RESB} + .262 \text{ RMC} + 2.142 (\text{MTGRSB}/\text{SB})_{-1} \\ & (1.5) \quad (6.1) \quad (1.5) \\ & + .161 \text{ DMYSRB} + .614 \text{ RSB}_{-1} - 1.069 \\ & (4.7) \quad (5.3) \quad (5.0) \end{aligned}$$

$$\begin{aligned} R^2 &= .997 \\ SE &= .031 \end{aligned}$$

b. Post 1966 (ceiling rate period)

$$\Delta \text{RSB} = .242 (\text{CRSB} - \text{RSB}_{-1}) \cdot (\text{RMC} - \text{RSB}_{-1}) - .049$$

(10.8) (2.1)

$$\text{RSB} \leq \text{CRSB}$$

$$\begin{aligned} R^2 &= .93 \\ SE &= .054 \end{aligned}$$

G6 *Asset Earnings Yields*

a. Savings and loan associations

$$\text{RESL} = .110 \sum_{i=0}^3 .25 \text{ RMC}_i + .874 \text{ RESL}_{-1} + .079$$

(7.5) (33.0) (1.0)

$$\begin{aligned} R^2 &= .997 \\ SE &= .029 \end{aligned}$$

b. Mutual savings banks

$$\text{RESB} = .040 \sum_{i=0}^3 .25 \text{ RMC}_i + .984 \text{ RESB}_{-1} - .098$$

(5.7) (120.5) (5.0)

$$\begin{aligned} R^2 &= .999 \\ SE &= .015 \end{aligned}$$

DEFINITIONS:

CRSB	Ceiling rate — savings banks
CRSL	Ceiling rate — savings and loan
CRTDH	Ceiling rate — household time deposits
DMYSRB	Dummy variable, 1962 and after = 1.0
FHLBA	Federal home loan bank advances
LCMLI	Long-term credit market assets — life insurance companies
LCMISB	Long-term credit market assets — savings banks

LCMISL	Long-term credit market assets — savings and loan
LI	Life insurance reserves
MTGRLLI	Residential mortgage assets — life insurance companies
MTGRSB	Residential mortgage assets — savings banks
MTGRSL	Residential mortgage assets — savings and loan
PCPSL	Weight on certificate rate used in constructing RSL
RBAA	Corporate bond rate
RESB	Rate earned on assets — savings banks
RESL	Rate earned on assets — savings and loan
RFHLBA	Rate charged on FHLB advances
RG3m	Three month treasury bill rate
RSB	Deposit rate — savings banks
RSL	Deposit rate — savings and loans
SCMILI	Short-term credit market assets — life insurance companies
SCMISB	Short-term credit market assets — savings banks
SCMISL	Short term credit market assets — savings and loan
T	Time trend, 194601 = 1
XRG3M	$\sum_{i=0}^7 w_i \text{RG3M}$, w_i 's = .20, .175, .15, .125, .10, .075, .05, .025

H. Market Interest Rates

H1 Short-term Credit Market Securities

$$\text{SCMI} = \text{SCMILGF} + \text{OMPLB} + \text{OMPLCB} + \text{OMPLFOR} + \text{BGSL1}$$

H2 Long-term Credit Market Securities

$$\begin{aligned} \text{LCMI} = & \text{BCPLB} + \text{STKLB} + \text{MTGC} + \text{BUS5} + \text{GF} + \text{BCSL1} + \text{LCMILCB} \\ & + \text{LCMILFOR} + \text{BUSSBH} \end{aligned}$$

H3 Short-term Credit Market Assets — Households

$$\begin{aligned} \text{SCMIR} = & \text{SCMI} - \text{SCMIB} - \text{SCMIGSL} - \text{SCMIFOR} - \text{SCMICB} - \text{SCMISB} \\ & - \text{SCMISL} - \text{SCMILI} - \text{SCMIE} \end{aligned}$$

H4 Long-term Credit Market Assets — Households

$$\begin{aligned} \text{LCMIR} = & \text{LCMI} - \text{LCMIGSL} - \text{LCMIFOR} - \text{BUS5} + \text{CB} - \text{BGSLCB} \\ & + \text{BGSL1} - \text{CB} - \text{OLCMICB} - \text{LCMISB} - \text{LCMISL} - \text{LCMILI} \\ & - \text{LCMIE} \end{aligned}$$

H5 Three-five Bond Rate

$$\begin{aligned} \text{RG35} = & 1.0 \text{RDEP} + 64.634 \text{LCMIR}/\text{KNAFA}_{-1} + 161.007 \text{SCMIR}/\text{KNAFA}_{-1} \\ & (\text{constr}) \quad (3.7) \quad (13.3) \\ & - 26.634 \text{LCMIR}_{-1}/\text{KNAFA}_{-2} - 95.354 \text{SCMIR}_{-1}/\text{KNAFA}_{-2} \\ & (1.3) \quad (7.2) \\ & + .174 \text{TIME} - 27.102 \\ & (5.5) \quad (5.6) \end{aligned}$$

$$\begin{aligned} R^2 &= .92 \\ \text{SE} &= .20 \end{aligned}$$

H6 *Three-month Bill Rate*

$$\begin{aligned}
 \text{RG3M} &= .716 \text{ RG35} + .225 \text{ RG35}_{-1} + 43.734 \text{ SCMIR/KNAFA}_{-1} \\
 &\quad (6.1) \quad (2.4) \quad (2.3) \\
 &\quad - 29.283 \text{ LCMIR}_{-1}/\text{KNAFA}_{-2} - 1.816 \text{ XRG3M}_{-1} \\
 &\quad (3.7) \quad (9.2) \\
 &\quad + 33.739 (.5\text{C} + .5\text{C}_{-1})/\text{KNAFA} + .248 \text{ TIME} + 11.277 (1000/\text{KNAFA}_{-1}) \\
 &\quad (2.5) \quad (4.2) \quad (4.0) \\
 &\quad - 27.747 \\
 &\quad (3.5)
 \end{aligned}$$

$$\begin{aligned}
 R^2 &= .99 \\
 \text{SE} &= .14
 \end{aligned}$$

H7 *Corporate Bond Rate - BAA*

$$\begin{aligned}
 \text{RBAA} &= .373 \Delta \text{RG3M} + .144 \Delta \text{RG3M}_{-1} + 1.264 \text{ XRG3M}_{-1} \\
 &\quad (8.6) \quad (3.2) \quad (7.8) \\
 &\quad + .843 (\text{RDEP1} + \text{RDEP1}(-1))/2.0 + 28.600 \text{ LCMIR/KNAFA}_{-1} \\
 &\quad (2.5) \quad (5.1) \\
 &\quad + 37.725 \text{ SCMIR}_{-1}/\text{KNAFA}_{-1} + .080 \text{ TIME} - 18.420 \\
 &\quad (3.6) \quad (4.6)
 \end{aligned}$$

$$\begin{aligned}
 R^2 &= .99 \\
 \text{SE} &= .14
 \end{aligned}$$

H8 *Weighted Average Deposit Rates* (used above; weights are taken from household deposit equations)

$$\begin{aligned}
 \text{RDEP1} &= (.592 \text{ RSB} + 2.204 \text{ RSL} + 2.355 \text{ RTDH})/5.151 \\
 \text{RDEP} &= (.725 \text{ RDEP1} + 1.953 \text{ RCD})/7.104
 \end{aligned}$$

H9 *State and Local Bond Rate*

$$\begin{aligned}
 \text{RGSL} &= .135 \text{ RBAA} + .259 \text{ RG35} - 44.477 \text{ TIME/KNAFA} \\
 &\quad (1.6) \quad (6.7) \quad (2.9) \\
 &\quad - 38.596 (\text{SB} + \text{SL} + \text{TDH} + \text{LI})/\text{KNAFA} \\
 &\quad (5.8) \\
 &\quad + 4.109 (\text{BGS} - \text{BGS}(\text{LCB})) / (\text{LCMIR} + \text{SCMIR}) + 15.888 \\
 &\quad (1.6) \quad (4.8)
 \end{aligned}$$

$$\begin{aligned}
 R^2 &= .99 \\
 \text{SE} &= .11
 \end{aligned}$$

H10 *Conventional Mortgage Rate*

$$\begin{aligned}
 \Delta \text{RMC} &= -.135 \Delta \% \text{MTGR} - .051 \Delta \% \text{MTGR}_{-1} - .262 \text{ VAC}_{-1} + .196 \text{ RG35} \\
 &\quad (3.6) \quad (1.7) \quad (3.3) \quad (5.0) \\
 &\quad - .066 \Delta \text{PXFI} - .283 \text{ RMC}_{-1} + 1.791 \\
 &\quad (3.7) \quad (4.3) \quad (4.0)
 \end{aligned}$$

$$\begin{aligned}
 R^2 &= .90 \\
 \text{SE} &= .098
 \end{aligned}$$

$$\text{PXPI} = \Delta\% (.7\text{SL} + .23\text{SB} + .03\text{EACB} + .05\text{LI})$$

H11 *Dividend – Price Ratio*

$$\begin{aligned}
 RDP = & .393 RBAA - .392 RBAA_{-1} - .471 (ZB + CCACORP)/DIV \\
 & (3.6) \quad (3.4) \quad (3.0) \\
 & + .198 (ZB_{-1} + CCACORP_{-1})/DIV_{-1} + .475 D6202 - .038 T60 \\
 & (1.2) \quad (2.6) \quad (2.7) \\
 & + .498 RDP_{-1} + 5.258 \\
 & (3.6) \quad (2.6)
 \end{aligned}$$

$$\begin{aligned}
 R^2 &= .87 \\
 SE &= .18
 \end{aligned}$$

DEFINITIONS:

BCPLB	Corporate bond liability – Business
BGSL1	State and local short-term debt
BGSL1 – CB	State and local short-term debt – commercial banks
BGSLCB	State and local government debt – commercial banks
BUS5 + CB	Long-term U.S. government securities – commercial banks
BUS5 + GF	Long-term U.S. government securities
BUSSBH	U.S. government savings bonds
C	Total consumption
CCACORP	Corporate capital consumption allowances
D6202	Dummy variable, 196202 = 1.0
DIV	Corporate dividend payments
KNAFA	Household financial assets
LCMI	Long-term credit market assets
LCMIFOR	Long-term credit market assets – foreign assets
LCMIGSL	Long-term credit market assets – S&L government assets
LCMIE	Long-term credit market assets – Residual
LCMILCB	Long-term credit market assets – Commercial bank liability
LCMILFOR	Long-term credit market assets – Foreign liability
LCMILF	Long-term credit market assets – Life insurance assets
LCMIR	Long-term credit market assets – Household assets
LCMISB	Long-term credit market assets – Savings banks assets
LCMISL	Long-term credit market assets – Savings and loan assets
LI	Life insurance company reserves
MTGR	Residential mortgage stock
OLCMICB	Other long-term assets – Commercial banks
OMPLB	Open market paper – Business liability
OMPLCB	Open market paper – Commercial bank liability
OMPLFOR	Open market paper – Foreign liability
RBAA	Corporate bond rate
RDEP	Weighted average deposit rate (includes CD rate)
RDEP1	Weighted average deposit rate (excludes CD rate)
RDP	Dividend-price ratio
RGSL	State and local bond rate
RG35	3-5 U.S. government securities rate
RG3m	3 month bill rate
RMC	Conventional mortgage rate
SB	Savings bank deposits
SCMI	Short-term credit market instruments
SCMIB	Short-term credit market instruments – Business assets
SCMICB	Short-term credit market instruments – Commercial bank asset
SCMIE	Short-term credit market instruments – Residual
SCMIFOR	Short-term credit market instruments – Foreign assets
SCMIGSL	Short-term credit market instruments – S&L government assets
SCMILGF	Short-term credit market instruments – Federal government liability
SCMILI	Short-term credit market instruments – Life insurance assets
SCMIR	Short-term credit market instruments – Household assets

SCMISB	Short-term credit market instruments – Savings bank assets
SCMISL	Short-term credit market instruments – Savings and loan assets
SL	Savings and loan deposits
T60	Trend – constant after 1959
TDH	Household time deposits
TIME	Trend 194601 = 1.0
VAC	Residential vacancy rate
XRG3M	$\sum_{i=0}^7 w_i \text{RG3M}$, w_i 's = .20, .175, .15, .125, .10, .075, .05, .025
ZB	Corporate profits

I. Consumer Credit

11 Household Consumer Credit Liabilities

$$\Delta\text{CCH} = .450 \text{CD} + .236 \text{CD}_{-1} + .318 \text{TIME} - .531 \text{CCH}_{-1} - 14.913$$

(10.4) (3.6) (8.5) (10.6) (10.0)

$R^2 = .93$
SE = .58

12 Commercial Bank Consumer Credit Assets

$$\Delta\text{CCCB} = .592 \Delta\text{CCH} + .171 \text{RBAA}_{-1} - .019 \Delta\text{LNEXCB}_{-1}$$

(15.2) (2.2) (2.9)

$$- .013 \text{TIME} - .269$$

(1.7) (1.1)

$R^2 = .95$
SE = .31

13 Consumer Credit Assets of Credit Unions and Residual

$$\Delta\text{CCU} + \text{E} = .069 \Delta\text{CCH} + .0735 \text{RBAA}_{-1} - 2.05$$

(9.3) (6.9) (3.7)

$R^2 = .90$
SE = .08

14 Business Consumer Credit Assets

$$\text{CCB} = \text{CCH} - \text{CCCB} - \text{CCCU} + \text{E}$$

DEFINITIONS:

CCCB	Consumer credit assets – Commercial banks
CCB	Consumer credit assets – Business
CCCU + E	Consumer credit assets – Credit unions and other
CCH	Consumer credit liabilities – Households
CD	Consumer durable good expenditures (SAAR)
LNEXCB	Excess loan demand – Commercial banks
RBAA	Corporate bond rate
TIME	Trend 194601 = 1.0

PART II. REAL SECTORS

A. Aggregate Demand Sector

A1 Automobile Demand

$$\begin{aligned} \Delta \text{CDCAR58} = & -0.291 + 0.116 \Delta \left(\frac{\text{YD} - \text{VG}}{\text{PC}} \right) - 0.272 \text{CDCAR58}_{-1} - 1.337 \Delta \text{U} \\ & (.60) \quad (2.72) \qquad (5.14) \qquad (2.68) \\ & + 0.096 \Delta \text{C58}_{-1} + 0.211 \cdot .5 \left(\frac{\text{SAVEPER}_{-1}}{\text{PC}_{-1}} + \frac{\text{SAVEPER}_{-2}}{\text{PC}_{-2}} \right) \\ & (2.01) \qquad (7.29) \\ & + 2.425 \Delta \text{DMY55} + 1.092 \text{DMYCAR} \\ & (4.59) \qquad (7.91) \end{aligned}$$

$$R^2 = .913$$

$$\text{SE} = .72$$

A2 Durable Goods

$$\begin{aligned} \Delta \text{CD58} = & 1.619 - 0.0714 \text{CD58}_{-1} + 0.310 \Delta \text{ICR58} + .200 \Delta \left(\frac{\text{YD} - \text{VG}}{\text{PC}} \right) \\ & (2.78) \quad (2.50) \qquad (2.50) \qquad (3.67) \\ & + 2.425 \Delta \text{DMY55} + .213 \cdot .5 \left(\frac{\text{SAVEPER}_{-1}}{\text{PC}_{-1}} + \frac{\text{SAVEPER}_{-2}}{\text{PC}_{-2}} \right) \\ & (3.90) \\ & + 1.115 \text{DMYCAR} + 0.129 \Delta \text{C58}_{-1} - 1.398 \Delta \text{U} \\ & (6.98) \qquad (2.59) \qquad (2.45) \end{aligned}$$

$$R^2 = .925$$

$$\text{SE} = .83$$

A3 Nondurables and Services

$$\Delta \text{CNS58} = 2.060 + 0.295 \Delta \text{YD58} + 0.116 \Delta \text{YD58}_{-1}$$

$$R^2 = .671$$

$$\text{SE} = 1.17$$

A4 Nonfarm Inventories

$$\begin{aligned} \text{INVEAF58} = & -25.767 - 0.410 \text{INVEAF58}_{-1} + 0.176 \text{SF58} + 0.108 \text{SF58}_{-2} \\ & (6.89) \quad (6.78) \qquad (5.99) \qquad (2.42) \\ & 1.667 \cdot .5 \Delta \left(\frac{\text{OEQD}_{-1}}{\text{PXPNF}_{-1}} + \frac{\text{OEQD}_{-2}}{\text{PXPNF}_{-2}} \right) - 0.396 \text{TIME} + 1.510 \text{DMYINV58} \\ & (6.30) \qquad (5.30) \qquad (5.88) \end{aligned}$$

$$R^2 = .895$$

$$\text{SE} = 1.419$$

A5 Imports

$$\begin{aligned} \text{M58} = & -12.755 + .031 \text{XPNF58} + .510 \text{DMYUSCANAUTO} + 1.504 \text{DMYM58} \\ & (2.51) \quad (8.71) \qquad (7.22) \qquad (4.66) \\ & - 5.304 \text{PM} + .271 \text{M58}_{-1} + 21.135 \text{PXPNF} \\ & (1.54) \quad (2.41) \qquad (3.60) \end{aligned}$$

$$R^2 = .99$$

$$\text{SE} = .506$$

A6 *Investment in Producers Durable Equipment*

$$\text{IPDE58} = -19.287 + .0725 \cdot \left(\frac{\text{XPNF58} + \text{XPNF58}_{-1}}{2} \right) + \sum_{i=0}^5 b_i (\text{PDEREAL}_{-i-1} \cdot \text{XPNF58}_i) + \sum_{i=0}^5 c_i (\text{PDEREAL}_i \cdot \text{XPNF58}_i) - .303 \text{ TIME} + .0776 \text{ KIPDE}(-1)$$

(7.11) (constr)

$b_0 = .0229$	$c_0 = -.0222$
$b_1 = .0272$	$c_1 = -.0227$
$b_2 = .0238$	$c_2 = -.0196$
$b_3 = .0159$	$c_3 = -.0145$
$b_4 = .00715$	$c_4 = -.00856$
$b_5 = .000715$	$c_5 = -.00327$

Sum of weights = .0977	= -.0909
(4.02)	(3.50)
	$R^2 = .99$
	SE = .60

a. Real Price of Capital

$$\text{PDEREAL} = \frac{\text{PXPNF}}{\text{PIPDE} \cdot (\text{PDEDEP} + \text{RDIS}) \cdot \text{PDETAX}}$$

b. Discount Rate

$$\text{RDIS} = .01 (\text{RBAA} + 4.5)$$

c. Tax Adjustments

$$\text{PDETAX} = (1.0 - \text{PDEITC} - \text{RTCGF} * \text{PDEZAD}) / (1.0 \text{ RTCGF})$$

A7 *Nonresidential Construction*

$$\text{ICER58} = 3.66 + \sum_{i=2}^7 b_i \text{RDIS}_{-i} - .112 \text{ TIME} + .303 \cdot .5 (\text{IPDE58} + \text{IPDE58}_{-1}) + .0305 \text{ KICER}_{-1}$$

(8.13) (6.51) (9.75) (constr)

$b_2 = -65.359$
$b_3 = -81.009$
$b_4 = -86.041$
$b_5 = -80.457$
$b_6 = -64.255$
$b_7 = -37.437$

Sum of weights = -414.556	
(4.75)	$R^2 = .832$
	SE = .683

A8 *Residential Construction*

$$\text{ICR58} = 21.943 + 1.055 \Delta \text{MTGR58} + .47040 \Delta \text{MTGR58}_{-1} - .1343 \text{ TIME} + 6.036 \Delta \text{PHH} - 3.743 \cdot .5 (\text{RMC}_{-1} - \text{RBAA}_{-1} + \text{RMC}_{-2} - \text{RBAA}_{-2}) + 0.991 \text{ DMYICR58}$$

(21.0) (11.1) (4.75) (5.80) (2.25) (7.26) (3.592)

$$\text{MTGR58} = \frac{\text{MTGR} - \text{MTGR}_{-1}}{\text{PICR}}$$

$R^2 = .971$
SE = .46

A9 *Total Private Fixed Investment*

$$IFIX58 = IPDE58 + ICER58 + ICR58$$

A10 *Construction by State and Local Governments*

$$\begin{aligned} ICVGSL58 = & 2.385 + .02805 \cdot .333 (GNP58_{-1} + GNP58_{-2} + GNP58_{-3}) \\ & (4.60) \quad (13.21) \\ & + 1.1366 \text{ VAID}58 \\ & (8.03) \\ & - 2.177 \cdot .166 (RGSL + RGSL_{-1} + RGSL_{-2} + RGSL_{-3} + RGSL_{-4} + RGSL_{-5}) \\ & (9.88) \end{aligned}$$

$$\begin{aligned} R^2 &= .969 \\ SE &= .50 \end{aligned}$$

A11 *State and Local Government Purchases of Goods and Services*

$$GSL58 = ICVGSL58 - GSLO58$$

A12 *Gross National Product*

$$\begin{aligned} GNP58 = & CD58 + CNS58 + .INVEAF58 + EX58 - M58 + IPDE58 \\ & + ICER58 + ICR58 + GSL58 + .INVAF58 + GF58 \end{aligned}$$

A13 *Private Nonfarm GNP*

$$XPNF58 = GNP58 - XGG58 - XAF58$$

A14 *Index of Manufacturing Capacity*

$$\begin{aligned} \Delta KMF58 = & 0.188 + .0719 \text{ IPDE}58 + .495 \Delta KMF58_{-1} - .0188 \text{ KMF}58_{-1} \\ & (2.15) \quad (8.56) \quad (7.06) \quad (6.72) \end{aligned}$$

$$\begin{aligned} R^2 &= .98 \\ SE &= .12 \end{aligned}$$

A15 *Manufacturing Production Index*

$$\begin{aligned} XMF58 = & -6.152 + .103 \text{ XPNF}58 + .199 \text{ CD}58 + .297 \text{ .INVEAF}58 \\ & (3.46) \quad (9.88) \quad (3.87) \quad (6.38) \\ & + .104 \text{ GF}58 + .677 \text{ OEQD}58_{-1} + .478 \text{ OEQD}58_{-2} \\ & (3.08) \quad (3.16) \quad (2.59) \end{aligned}$$

$$\begin{aligned} R^2 &= .99 \\ SE &= .74 \end{aligned}$$

A16 *Capacity Utilization*

$$KUMF58 = XMF58 / KMF58$$

B. *Prices, Wages, and Employment*

B1 *Productivity*

$$\begin{aligned} \text{PROD} = & -.946 + .0446\% \Delta \text{XPNF}58 + .0107\% \Delta \text{XPNF}58_{-1} - .0151\% \Delta \text{XMF}58 \\ & (1.31) \quad (10.0) \quad (1.89) \quad (6.74) \\ & -.00917\% \Delta \text{XMF}58_{-1} + .278 \text{ KUMF}58_{-1} + 2.04 \left(\frac{\text{LCM}20+}{\text{LC}} \right) + .010 \text{ TIME} \\ & (3.43) \quad (2.04) \quad (2.07) \quad (3.33) \\ & + .734 \text{ PROD}_{-1} \\ & (7.95) \end{aligned}$$

$$\begin{aligned} R^2 &= .999 \\ SE &= .016 \end{aligned}$$

B2 *Manhours — Private Nonfarm*

$$\text{MHPNF} = \text{XPNF58}/\text{PROD}$$

B3 *Average Hours Per Employee*

$$\text{MH}/\text{EPNF} = .422 + .643 \text{ MH}/\text{EPNF}_{-1} + .00482\% \Delta \text{MHPNF} + .451 \left(\frac{\text{LCM20+}}{\text{LC}} \right)$$

(7.31) (15.0) (11.8) (8.67)

$$R^2 = .99$$
$$\text{SE} = .0035$$

B4 *Employment — Private Nonfarm*

$$\text{EPNF} = \text{MHPNF} / \text{MH}/\text{EPNF}$$

B5 *Total Employment*

$$\Delta E = .7 \Delta(\text{EPNF} + \text{EEGF} + \text{EEGSL})$$

B6 *Labor Force Participation Rate — Male 20 and Over*

$$\text{LCPRM20+} = .886 - .000795 \text{ TIME} + .457 \left(\frac{\text{LAF}}{\text{NC}} \right) + .129 \text{ RU}$$

(149.0) (41.6) (3.16) (2.48)

$$R^2 = .98$$
$$\text{SE} = .0030$$

B7 *Labor Force Participation Rate — Excluding Males 20 and Over*

$$\text{LCPREM20+} = .357 + .00103 \text{ TIME} - .390 \left(\frac{\text{LAF}}{\text{NC}} \right) - .311 \text{ RU}$$

(26.6) (23.7) (1.19) (2.64)

$$R^2 = .943$$
$$\text{SE} = .0018$$

B8 *Civilian Labor Force*

$$\text{LC} = \text{LCPRM20+} \cdot \text{NCM20+} + \text{LCPREM20+} \cdot \text{NCEM20+}$$

B9 *Unemployment Rate*

$$\text{RU} = 1 - \frac{E}{\text{LC}}$$

B10 *Unemployment Rate — Males 25 and Over*

$$\text{RUM25+} = -.0874 - .000519\% \Delta \text{XPNF58} + .781 \text{ RU} + .144 \text{ RUM25+}_{-1}$$

(8.15) (2.28) (12.4) (1.76)

$$+ .129 \left(\frac{\text{LCM20+}}{\text{LC}} \right)$$

(7.52)

$$R^2 = .987$$
$$\text{SE} = .00136$$

B11 *Index of Hourly Earnings — Private Nonfarm*

$$\% \Delta \text{AHEPNF} = 2.71 - 27.69 \text{ RUM25+} - .467 \text{ DMYGP}$$

(9.68) (5.37) (4.07)

$$+ .485 \cdot .5 \cdot (\% \Delta \text{PC} + \% \Delta \text{PC}_{-1})$$

(4.41)

$$R^2 = .85$$
$$\text{SE} = .25$$

B12 *Index of Earnings Plus Supplements*

$$\Delta \Delta \text{AHEPNF} = \text{AHEPNF} \cdot (\text{WSS}/\text{WS})$$

B13 *Wage Rate -- Private Nonfarm*

$$\% \Delta \text{WRPNF} = .221 + .828\% \Delta \text{AAHEPNF} + .0958\% \Delta \text{GNP}$$

(.83) (8.47) (1.957)

$$R^2 = .726$$

$$SE = .43$$

B14 *Unit Labor Costs*

$$\text{ULC} = \text{WRPNF}/\text{PROD}$$

B15 *Wages, Salaries, and Supplements -- Private Nonfarm*

$$\text{WSSPNF} = \text{XPNF58} \cdot \text{ULC}$$

B16 *Wages, Salaries, and Supplements*

$$\text{WSS} = \text{WSSPNF} + \text{XGG58} \cdot \text{PXGG} + \text{WSSAF}$$

B17 *Wages and Salaries*

$$\text{WS} = \text{WSS} - \text{TWER} - \text{YOL}$$

B18 *Private Nonfarm Price Deflator*

$$\% \Delta \text{PXPNF} = -.0268 + .040\% \Delta \text{KUMFRB} - 34.598(\text{ULC} - \text{ULCB})$$

(.72) (3.64) (3.32)

$$+ .469(\% \Delta \text{PXPNF}_{-1} - \sum_{i=1}^6 b_i \% \Delta \text{ULCB}_{-i-1})$$

(5.129) (constr)

$$+ .08\% \Delta \left(\frac{\text{TXGSL}_{-1} + \text{TXGF}_{-1}}{\text{XPNF58}_{-1}} \right) + \sum_{i=0}^5 b_i \% \Delta \text{ULCB}_i$$

$$+ .08\% \Delta \left(\frac{\text{TXGSL} + \text{TXGF}}{\text{XPNF58}} \right)$$

(constr)

$$b_0 = .36$$

$$b_1 = .25$$

$$b_2 = .15$$

$$b_3 = .08$$

$$b_4 = .05$$

$$b_5 = .03$$

$$R^2 = \text{N. A.}$$

$$SE = .214$$

$$\text{ULCB} = \text{WRPNF} / (1.012 * \sum_{i=0}^3 c_i \text{PROD})$$

(constr)

$$c_0 = .4$$

$$c_1 = .3$$

$$c_2 = .2$$

$$c_3 = .1$$

B19 *Consumption Deflator*

$$\% \Delta \text{PC} = .00113 + .255\% \Delta \text{PC}_{-1} + .0530\% \Delta \text{PXA} + .64901\% \Delta \text{PXPNF}$$

(.016) (3.08) (6.23) (8.50)

$$R^2 = .925$$

$$SE = .20$$

B20 *Residential Construction Deflator*

$$\% \Delta \text{PICR} = .551 + .729\% \Delta \text{PXPNF}$$

(1.52) (2.81)

$$R^2 = .193$$

$$SE = 1.09$$

B21 *Nonresidential Construction Deflator*

$$\% \Delta \text{PIFIXER} = -.252 + 1.23\% \Delta \text{PXPNF}$$
$$(1.60) (11.4)$$

$$R^2 = .855$$
$$SE = .41$$

B22 *Export Deflator*

$$\% \Delta \text{PEX} = -.171 + 1.12\% \Delta \text{PXPNF} + 1.41 \text{ DMYM58}$$
$$(.56) (5.21) (3.06)$$

$$R^2 = .598$$
$$SE = .786$$

B23 *Federal Government Purchaser Deflator*

$$\% \Delta \text{PGF} = .0724 + 1.526\% \Delta \text{PXPNF}$$
$$(.195) (5.759)$$

B24 *State and Local Government Purchaser Deflator*

$$\% \Delta \text{PGSL} = .876 + 1.049\% \Delta \text{PXPNF}$$
$$(4.63) (7.76)$$

$$R^2 = .646$$
$$SE = .565$$

B25 *General Government Deflator*

$$\% \Delta \text{PXGG} = .115 + 1.283\% \Delta \text{AHEPNF}_{-1}$$
$$(.257) (6.37)$$

C. Current Dollar Output and Income Distribution

C1 *Consumption*

$$C = C58 \cdot PC$$

C2 *Nonresidential Construction*

$$\text{IFIXER} = \text{PIFIXER} (\text{IPDE58} + \text{ICER58})$$

C3 *Residential Construction*

$$\text{ICR} = \text{PICR} \cdot \text{ICR58}$$

C4 *Inventories*

$$\text{.INV} = \text{.INVEAF58} + \text{.INV} - \text{INVEAF58}$$

C5 *Federal Government Expenditures*

$$\text{GF} = \text{PGF} \cdot \text{GF58}$$

C6 *Net Exports*

$$\text{EX-M} = \text{EX58} \cdot \text{PEX} - \text{PM} \cdot \text{M58}$$

C7 *Gross National Product*

$$\text{GNP} = C + \text{IFIXER} + \text{ICR} + \text{.INV} + \text{GF} + \text{EX-M} + \text{GSL}$$

C8 *Capital Consumption Allowances*

a. Corporate capital consumption allowances

$$\Delta\text{CCACORP} = .156 + .0356\Delta\text{XPNF} + .0354 \Delta\text{XPNF}_{-1}$$

(.69) (3.03) (2.97)

$$R^2 = .561$$

$$SE = .59$$

b. Total capital consumption allowances

$$\text{CCA} = \text{CCACORP} + \text{CCAH} + \text{CCAO}$$

C9 *Indirect Business Taxes and Nontax Accruals to the Federal Government*

$$\frac{\text{TXGF}}{\text{GNP}} = .0256 + .799 \text{RDCAR} + 1.180 \text{DIBT} + .0000545 \text{TIME}$$

(54.1) (8.43) (22.8) (15.0)

$$R^2 = .99$$

$$SE = .00026$$

C10 *Indirect Business Taxes and Nontax Accruals to State and Local Governments*

$$\Delta\text{TXGSL} = .192 + .0119 \Delta(\text{C} \cdot \text{RTXGSL}) + .506 \Delta\text{TXGSL}_{-2}$$

(1.62) (7.03) (5.58)

$$R^2 = .90$$

$$SE = .35$$

C11 *Corporate Return on Capital (Profits, Capital Consumption, and Net Interest)*

a. Property income

$$\text{PY} = \text{XPNF} - \text{TXGSL} - \text{TXGF} - \text{WSSPNF}$$

b. Corporate return on capital

$$\text{ZBX} = -19.65 + .627 \text{PY} + .0847 \text{KUMFRB} \cdot \text{PY} + .197 \cdot .5 (\text{PY} + \text{PY}_{-1})$$

(34.39) (83.8) (11.05) (7.32)

$$- .664 \text{STAT}$$

(10.72)

$$R^2 = .99$$

$$SE = .45$$

C12 *Corporate Profits Before Tax Including Inventory Valuation*

$$\text{ZB} = \text{ZBX} - \text{INTBUS} - \text{CCACORP}$$

C13 *Corporate Inventory Valuation Adjustment*

$$\text{IVACORP} = .221 - .00595\% (\text{PXPNF} \cdot \text{INVEAF}_{-1})$$

(.80) (8.72)

$$R^2 = .69$$

$$SE = .99$$

C14 *Corporate Profits Tax Accruals to the Federal Government*

$$\Delta\text{TCGF} = -.181 + .872 \Delta[\text{RTCGF} \cdot (\text{ZBU} - \text{TCGSL})]$$

(.927) (27.7)

$$- .0148 (\text{ZBU} - \text{ZB}_{-2} - \text{TCGSL} + \text{TCGSL}_{-2})$$

(1.26)

$$+ .00371 \text{TIME} - \text{ITC}$$

(1.39)

$$R^2 = .981$$

$$SE = .317$$

C15 *Corporate Profits Tax Accruals to State and Local Governments*

$$TCGSL = RTGSL \cdot ZBU$$

C16 *Employers Contribution to Social Security*

$$\begin{aligned} \frac{TWPER}{WS} = & .0099 + .361 OASIR + .073 OASIC \\ & (.399) \quad (39.1) \quad (8.8) \\ & + .00414 (RTUIGSL + RTUIGF) - .514 OASIB/AHEPNF \\ & (16.9) \quad (2.87) \\ & - .00229 (AHEPNF/OASIB) \\ & (3.34) \end{aligned}$$

$$\begin{aligned} R^2 &= .99 \\ SE &= .00053 \end{aligned}$$

C17 *Personal Contribution to Social Security*

$$\begin{aligned} \frac{TWPER}{WS} = & -.0268 + .360 OASIR + .0556 OASIC + .000527 OASDHIMED \\ & (1.488) \quad (40.29) \quad (9.83) \quad (7.24) \\ & - .0469 OASIB/AHEPNF - .0006724 (AHEPNF/OASIB) \\ & (.359) \quad (1.33) \end{aligned}$$

$$\begin{aligned} R^2 &= .99 \\ SE &= .000368 \end{aligned}$$

C18 *Dividends*

$$\begin{aligned} \frac{DIV}{(ZAU + CCACORP)} = & .356 - .00248\% (ZAU + CCACORP) \\ & (17.7) \quad (3.85) \\ & - .00153\% (ZAU_{-1} + CCACORP_{-1}) \\ & (2.86) \\ & - .513 \left(\frac{ZBU + CCACORP}{GNP} \right) \\ & (1.1) \\ & - 1.069 \left(\frac{ZBU_{-2} + CCACORP_{-2}}{GNP_{-2}} \right) - .000137 TIME \\ & (2.4) \quad (2.5) \end{aligned}$$

$$\begin{aligned} R^2 &= .78 \\ SE &= .0057 \end{aligned}$$

C19 *Unemployment Insurance Beneficiaries*

$$\begin{aligned} \Delta UIBEN = & -.0174 + .612 \Delta U - .068 \Delta U_{-1} \\ & (1.12) \quad (17.34) \quad (2.18) \end{aligned}$$

$$\begin{aligned} R^2 &= .91 \\ SE &= .090 \end{aligned}$$

C20 *State Unemployment Insurance Benefits*

$$VUSGF = UIBEN \cdot (VUSGF/UIBEN)$$

C21 *Government Transfer Payments to Persons*

$$VG = VUSGF + VGSL + VPERGF - VUSGF$$

C22 *Personal Income*

$$\begin{aligned} YP = & GNP - TXGF - TXGSL - ZB - TWER - TWPER + VG + DIV \\ & - CCA + SUBG - WALDP - WALDGF - WALDGSL + INTGF \\ & + INTGSL + INTC - STAT \end{aligned}$$

C23 *Federal Government Personal Tax and Nontax Receipts*

$$\text{TPGF} = \text{RTPGF} (\text{YP} - \text{VG} + \text{TWPER})$$

C24 *State and Local Government Personal Tax and Nontax Receipts*

$$\text{TPGSL} = \text{RTPGSL} (\text{YP} - \text{VG} + \text{TWPER})$$

C25 *Disposable Income*

$$\text{YD} = \text{YP} - \text{TPGF} - \text{TPGSL}$$

D. *Miscellaneous Equations and Identities*

D1 *Personal Savings*

$$\text{SAVEPER} = \text{YD} - \text{C} - \text{INTC} - \text{VFORPER}$$

D2 *New Orders – Equipment and Defense, Excluding Autos*

$$\begin{aligned} \text{OEQD58} = & -8.346 + .257\text{DOD58} + .0604 \text{XPNF58} - .168 \text{TIME} \\ & (12.356) (6.363) \quad (15.6) \quad (8.64) \\ & + .074 \cdot .3 \Delta(\text{XPNF58} + \text{XPNF58}_{-1} + \text{XPNF58}_{-2}) \\ & (4.08) \end{aligned}$$

$$\begin{aligned} R^2 &= .988 \\ SE &= .42 \end{aligned}$$

D3 *Durable Consumption – Current Dollars*

$$\text{CD} = \text{PCD} \cdot \text{CD58}$$

D4 *Residential Construction Expenditures – Households*

$$\text{ICRH} = \text{RICRH} \cdot \text{ICR}$$

D5 *Undistributed Profits*

$$\text{RE} = \text{ZAU} - \text{DIV}$$

D6 *Final Sales*

$$\text{SF} = \text{GNP} - \text{INV}$$

D7 *State and Local Government Receipts*

$$\text{TGSL} = \text{TPGSL} + \text{TCGSL} + \text{TXGSL} + \text{VAID} + \text{VAIDI}$$

D8 *State and Local Government Expenditures*

$$\text{EXPENGSL} = \text{GSL} + \text{VGSL} + \text{INTGSL} - \text{SURPGSL} - \text{WALDGSL}$$

D9 *Corporate Tax Payments to State and Local Governments*

$$\begin{aligned} \text{TCPGSL} = & -.138 + .202 \text{TCXGSL}_{-1} + .644 \text{TCPGSL}_{-1} + .329 \text{TCGSL}_{-1} \\ & (1.22) (1.70) \quad (4.89) \quad (1.72) \\ & + .959 \text{DMY196901} \\ & (3.79) \end{aligned}$$

$$\begin{aligned} R^2 &= .97 \\ SE &= .214 \end{aligned}$$

D10 *Corporate Tax Payments to the Federal Government
First Half of Year*

$$\begin{aligned} \text{TCPGF} = & -1.122 + 1.233 \cdot .5(\text{TCGF}_{-1} + \text{TCGF}_{-2}) \\ & (.468) \quad (9.50) \\ & - .889 (\text{TAXSCHE}1_{-2} \cdot \text{TCGF}_{-3}) + .947 (\text{TAXSCHE}1 \cdot \text{TCGF}_{-1}) \\ & (12.3) \quad (9.0) \\ & - .400[\text{TAXSCHE}2_{-2} \cdot .5(\text{TCGF}_{-1} + \text{TCGF}_{-2})] \\ & (4.8) \\ & + 1.065 \text{TAXSCHE}1 \cdot \Delta\text{TCGF} - 2.565 \text{DMYTCP}1968 \\ & (4.85) \quad (2.62) \end{aligned}$$

$$\begin{aligned} R^2 = \\ \text{SE} = .9654 \end{aligned}$$

Second Half of Year

$$\begin{aligned} \text{TCPGF} = & .719 + .705 \text{TCGF}_{-1} + .271 \text{TCGF}_{-2} - 3.74 \text{DMYTCP}1968 \\ & (.88) \quad (9.8) \quad (4.0) \quad (5.52) \end{aligned}$$

$$\begin{aligned} R^2 = \\ \text{SE} = .731 \end{aligned}$$

D11 *Unpaid Tax Liabilities to State and Local Governments*

$$\Delta\text{TCXGSL} = .5(\text{TCGF} - \text{TCPGF})$$

D12 *Unpaid Tax Liabilities to Federal Government*

$$\Delta\text{TCXGF} = .5(\text{TCGF} - \text{TCPGF})$$

D13 *Federal Government Receipts*

$$\text{TGF} = \text{TPGF} + \text{TCGF} + \text{TXGF} + \text{TWER} + \text{TWPER} - \text{TWGSL}$$

D14 *Federal Expenditures*

$$\begin{aligned} \text{EXPENGF} = & \text{VG} + \text{GF} + \text{VAID} + \text{INTGF} + \text{SUBGF} - \text{WALDGF} \\ & - \text{VGSL} + \text{VFORGF} \end{aligned}$$

D15 *Stock of Producers Durable Equipment*

$$\text{KIPDE} = \text{IPDE}58 + .9224 \text{KIPDE}_{-1}$$

D16 *Stock of Nonresidential Construction*

$$\text{KICER} = \text{ICER}58 + .9695 \text{KICER}_{-1}$$

D17 *Stock of Residential Construction*

$$\text{KICR} = \text{ICR}58 + .988 \text{KICR}_{-1}$$

D18 *Nonfarm Inventory Stock*

$$\text{INVEAF}58 = .\text{INVEAF}58 + \text{INVEAF}58_{-1}$$

D19 *Housing Vacancy Rate*

$$\begin{aligned} \Delta\text{VAC} = & -.423 - .145(\text{RMC}_{-1} - \text{RBAA}_{-1}) \\ & (5.56) \quad (3.69) \\ & - .31047(\% \Delta\text{PHH}_{-2} - \% \Delta\text{ICR}58_{-2}) \\ & (5.64) \end{aligned}$$

$$\begin{aligned} R^2 = .572 \\ \text{SE} = .078 \end{aligned}$$

DEFINITIONS OF VARIABLE NAMES FOR REAL SECTOR:

.INV	Total inventory accumulation
.INVAF58	Farm inventory accumulation — 1958 dollars
.INVEAF58	Non-farm inventory accumulation — 1958 dollars
AAHEPNF	Fixed weight wage index adjusted for fringe benefits
AHEPNF	Fixed weight wage index (excludes overtime in mfg.)
C	Total consumer expenditures
C58	Total consumer expenditures — 1958 dollars
CCA	Total capital consumption allowances
CCACORP	Corporate capital consumption allowances
CCAH	Capital consumption allowances — Households
CCAO	Capital consumption allowances — Other
CD	Consumer durable goods expenditures
CD58	Consumer durable goods expenditures — 1958 dollars
CDCAR58	Consumer expenditures on automobiles — 1958 dollars
CNS58	Consumer expenditures on nondurables and services — 1958 dollars
DIBT	Impact of changes in Federal indirect tax rates
DIV	Corporate dividend payments
DMY55	Dummy variable for 1955 change in credit terms
DMYCAR	Dummy variable of auto strikes
DMYGP	Dummy variable for wage and price guideposts
DMYICR58	Dummy variable for rise of mortgage refinancing in 1971
DMYINV58	Dummy variable for strikes
DMYM58	Dummy variable for strikes
DMYTCP68	Dummy variable for 1968 midyear tax surcharge
DMYUSCAN	Dummy variable for U.S.-Canadian automobile agreement
DODMPCA	Department of Defense military prime contract awards
E	Total employment — Household survey
EEGF	Federal government employment — Establishment survey
EEGSL	State and local government employment — Establishment survey
EPNF	Private non-farm employees — Establishment survey
EX — M	Net exports
EX — M58	Net exports — 1958 dollars
EX58	Exports — 1958 dollars
EXPENGF	Federal government expenditures
EXPENGL	State and local government expenditures
GF	Federal government purchases of goods and services
GF58	Federal government purchases of goods and services — 1958 dollars
GNP	Gross National Product
GNP58	Gross National Product — 1958 dollars
GSL	State and local government purchases of goods and services
GSL58	State and local government purchases — 1958 dollars
GSLO58	State and local government purchases except construction
ICER58	Nonresidential construction — 1958 dollars
ICR	Residential construction
ICR58	Residential construction — 1958 dollars
ICVGL58	State and local government construction — 1958 dollars
IFIX58	Fixed investment — 1958 dollars
IFIXER	Nonresidential fixed investment
INTBUS	Net interest paid by business
INTC	Consumer interest payments
INTGF	Federal government interest payments
INTGSL	State and local government interest payments
INVEAF58	Non-farm inventory stock
IPDE58	Investment in producer durable equipment — 1958 dollars
ITC	Investment tax credit
IVACORP	Corporate inventory valuation adjustment
KICER	Stock of non-residential structures — 1958 dollars

KICR	Stock of residential structures — 1958 dollars
KIPDE	Stock of producer durable equipment — 1958 dollars
KMFRB	Federal Reserve index of manufacturing capacity
KUMFRB	Federal Reserve index of manufacturing capacity utilization
LC	Civilian labor force
LCEM20+	Civilian labor force — except males over 20 years of age
LCM20+	Civilian labor force — males over 20 years of age
LCPREM20+	Labor force participation rate — except males over 20 years of age
LCPRM20+	Labor force participation rate — males over 20 years of age
M58	Imports — 1958 dollars
MH/EPNF	Hours per man per year — Private non-farm sector
MHPNF	Total manhours — Private nonfarm sector employees
MTGR	Residential mortgage stock
NC	Civilian population — 16 years and over
NCEM20+	Civilian population except males 20 years and over
NCM20+	Civilian population -- males 20 years and over
OASIB	OASI wage ceiling
OASIC	OASI ratio of covered employment to total
OASIR	OASDHI tax rate (employer and employee)
OEQD	Orders for equipment and defense goods
PC	Consumer expenditure deflator
PDECTAX	Impact of taxes on rental price of capital
PDEDEP	Depreciation rate used in rental price of capital
PDEITC	Rate of investment tax credit
PDEREAL	Relative rental price of capital
PDEZAD	Present value of capital depreciation allowances
PEX	Export deflator
PGF	Government purchases deflator
PGSL	State and local government purchases deflator
PHH	Potential rate of household formation (demographic projection)
PICR	Residential construction deflator
PIPDE	Producer durable equipment deflator
PM	Import price deflator
PROD	Output per manhour — Private non-farm sector
PXAF	Agricultural output deflator
PXGG	General government output deflator
PXPNF	Private non-farm output deflator
RBAA	Corporate bond rate
RDCAR	Excise tax rate on automobiles
RDIS	Discount rate for rental price of capital
RE	Corporate retained earnings
RGSL	State and local bond rate
RMC	Conventional mortgage rate
RTCGF	Maximum tax rate on corporate profits — Federal government
RTCGSL	Effective state and local tax rate on corporate profits
RTPGF	Effective tax rate on personal income — Federal government
RTPGSL	Effective tax rate on personal income — State and local governments
RTUI	Unemployment insurance tax rate
RTXGSL	State and local sales and gasoline tax rate
RU	Unemployment rate
RUM25+	Unemployment rate — Males 25 years of age and over
SAVEPER	Personal saving
SF58	Final sales — 1958 dollars
STAT	Statistical discrepancy
SUBG	Subsidies less surplus of government enterprises
SUBGF	Subsidies less surplus — Federal government
SUBGSL	Subsidies less surplus — State and local governments
TAXSCHD1	Proportion of Federal corporate tax liability paid in first half of year
TAXSCHD2	Proportion of Federal corporate tax liability paid in second half of year

TCGF	Corporate profits taxes — Federal government
TCGSL	Corporate profits taxes — State and local governments
TCPGF	Corporate tax payments — Federal government
TCPGSL	Corporate tax payments — State and local governments
TCXGF	Unpaid corporate tax liabilities — Federal government
TCXGSL	Unpaid corporate tax liabilities — State and local governments
TGF	Receipts — Federal government
TGSL	Receipts — State and local governments
TIME	Trend 194601 = 1.0
TPGF	Personal taxes — Federal government
TPGSL	Personal taxes — State and local governments
TWER	Employer contributions to social insurance
TWGSL	State and local government payments to social insurance
TWPER	Personal Contributions to Social Insurance
TXGF	Indirect business taxes — Federal government
TXGSL	Indirect business taxes — State and local governments
U	Total unemployed persons
UIBEN	Unemployment insurance beneficiaries
ULCB	Normal unit labor costs
VAC	Vacancy rate — Residential housing
VAID	Grants-in-aid
VAIDI	Grants-in-aid for capital projects
VFORGF	Federal government transfers to foreigners
VFORPER	Personal transfers to foreigners
VG	Federal government transfers
VGSL	State and local government transfers
VUSGF	Unemployment insurance benefits
WALDGF	Wage accruals less disbursements — Federal government
WALDGS	Wage accruals less disbursements — State and local governments
WALDP	Wage accruals less disbursements — Private
WRPNF	Compensation per manhour — Private non-farm sector
WS	Total wages
WSS	Total wages plus supplements
WSSPNF	Wages plus supplements — Private non-farm sector
XAF58	Agricultural output — 1958 dollars
XGG58	General government output — 1958 dollars
XMFRB	Federal Reserve index of manufacturing output
XPNF	Output — Private non-farm sector
XPNF58	Output — Private non-farm sector — 1958 dollars
YD	Disposable income
YD58	Disposable income — 1958 dollars
YOL	Other labor income
YP	Personal income
ZAU	Corporate profits after taxes
ZB	Corporate profits plus IVA
ZBU	Corporate profits before taxes
ZBX	Property income

DISCUSSION

DWIGHT M. JAFFEE*

The long-awaited unveiling of the Bosworth-Duesenberry model (hereafter the B-D model) is a significant occasion. It marks the transition from general, although large, models of the financial sector characterized by the Federal Reserve-M.I.T.-Penn model (hereafter the FMP model) to more specific models that follow Flow of Funds accounting directly. Indeed, the B-D model is only the first of at least several attempts to model the flow of funds.

In this context, I think it is useful to consider in rather broad scope the nature of flow-of-funds models. The questions that can be considered range from the basic goals and uses of the models, through the framework and specification, and to the details of estimation and simulation procedures. An alternative possibility would be to consider the B-D model itself in detail. The description of the B-D model, which I think is really excellent, however, is in a form that focuses attention on the general characteristics of these models. Also, as the authors indicate, "the financial model buff will soon recognize that many of the equations are essentially old stuff — differing in detail but not in essence from the treatment of corresponding sectors in other models". Still, the key and novel features of the B-D model will be used to illustrate most of the points.

The following discussion covers six main topics, and to keep the discussion brief, I shall just proceed from one topic to the next.

The Goals and Uses of Flow-of-Funds Models

From the B-D paper, it is clear that three major uses of the model are intended. First, their model is capable of generating multiplier values for the primary tools of monetary and fiscal policy. These are illustrated, for example, in their reported simulation experiments for

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an increase in, respectively, unborrowed reserves and government expenditures. The results they obtain are quite in line with those obtained from the FMP model: monetary policy operates slowly but with a strong cumulative effect; fiscal policy has a strong short-run impact, but then cycles toward what appears to be a zero long-run value. This general consistency of the results with other models is reassuring, but the long-run properties of the model and the related multipliers should be better understood.

The second major use of the model concerns the evaluation of the secondary policy tools. Examples of secondary tools would include discount-rate policy, selective credit controls, and HUD housing subsidies. Another example, illustrated in the paper with a simulation, is the FNMA supply of mortgage funds. It is clear that an important comparative advantage of large scale flow-of-funds models is in the evaluation of a wide variety of such secondary tools. Unfortunately, the B-D model, like earlier models, does not make many of these tools explicit in the model. Instead, one must rely on the expertise of the model-builders to modify correctly the model for the calculation of the multipliers.

The third major use of the model concerns the evaluation of basic structural changes in the financial markets. As an example, Bosworth and Duesenberry indicate that appraisal of the Hunt Commission proposals could be carried out with the model. I am sure they are right, but my own experience with the FMP model was that this is a very difficult process, and I see no way in which the structure of their model is going to make it easier.

There are two further general points that can be made concerning the uses of the model. First, there is a question of evaluating the effects of inflation on financial-market and real-sector activity. The experience with the FMP model has been that such an evaluation requires careful specification of nominal versus real rates of interest, of capital gains and their effects, and, of course, of inflationary expectations. This is all very difficult, and I am afraid it remains as an important area for further work. Second, there is the possibility of using the flow of funds models in a forecasting mode. Again based on experience with the FMP model, I would expect the B-D model to forecast reasonably well; however, the problem up to now has been one of the practicalities of the large size of the model and the requirements for recent data and the updating of the model itself, and I do not think Bosworth and Duesenberry have solved this.

The Structure of Flow-of-Funds Models

A prime virtue of flow-of-funds models is the discipline of flow-of-funds accounting. We are forced to recognize the full list of market participants, the full array of market instruments, and the various identities relating all of them. Unfortunately, the first thing we do, and Bosworth and Duesenberry face this issue directly, is to aggregate across both institutions and instruments. The appropriate level of aggregation, and the way the aggregates are formed, therefore become questions themselves. The B-D solutions to these problems are all well discussed and reasonable.

One related point in the Bosworth-Duesenberry discussion, however, is of general interest and deserves further mention. A distinction is drawn by the authors between the "term-structure, risk-structure" approach for financial sectors characteristic of the FMP model. It is my view, on the other hand, that this distinction is simply one of coefficient estimates, not of basic structure. The underlying theory of the "term-structure, risk-structure" approach is that certain assets and liabilities are *perfect substitutes*. The implication of perfect substitutes in terms of the model is that certain coefficients become zero and therefore that certain variables do not enter the final specification. The misunderstanding with respect to the FMP model, however, has been that the perfect substitutes were assumed as an *a priori* judgment. This, in fact, was not the case. The FMP model assumed a general structure not distinctly different from the B-D framework, and it was only in the estimation that certain coefficients turned out to be small or zero.

This of course raises the question whether Bosworth and Duesenberry have found these same coefficients to be small or zero. I do not intend here to go into the details of their estimation to provide an answer, and, in fact, comparative simulations will be really the best way to get at the issue. From a survey of their equations, however, it is at least my guess that the B-D model is much closer to the FMP in these respects than might be thought.

Individual and Sector Behavior

The basic behavioral postulate of financial-market models, and now of the B-D flow-of-funds model, remains the stock-adjustment principle. Individual units are assumed to strive toward some equilibrium portfolio of assets and liabilities, but the adjustment process is assumed to require significant time. One major problem with this

approach, of course, is the specification and estimation of the equilibrium portfolio. Bosworth and Duesenberry have a fine discussion of the issues relating to this problem, and then proceed in what is now a fairly standard way. A second major problem with the approach concerns the dynamic elements of the adjustment process. This received a great deal of attention in the FMP model, and Bosworth and Duesenberry pushed the analysis even further. Specifically, the major new element of their model is what they call the excess-loan-demand variable. This variable is effectively the difference between the increment in loan demand at commercial banks and the funds available from deposit growth for meeting this demand. The excess-demand variable is used in the B-D model as a dynamic element in a number of their equations, and it appears to work very well.

Institutional and Structural Change

The specification of institutional and structural change in models of financial markets have been increasingly a major concern of mine — and this includes both my own work on the FMP model and the B-D flow-of-funds effort. The mortgage and housing markets provide an excellent example of the problems. Over the last 10 to 15 years there have been significant changes in the regulation and institutional structure of time-deposit markets, mortgage markets, and the housing sector. To be more specific, in time-deposit markets we have seen the imposition of binding ceilings and the tremendous growth in “special” and “premium” rate accounts; and in the area of mortgage lending, the tax laws relating to mortgage loans and reserve accounts, as well as other Federal Home Loan Bank Board regulations, have changed significantly. In the housing markets, HUD subsidy programs have grown to the point where an important proportion of all housing starts are apparently HUD subsidized. My concern is whether we have given enough attention to the specification of these changes in our models. If we are really serious about using our models to evaluate proposals such as the Hunt Commission’s, then we must view these historic changes as opportunities for enriching our coefficient estimates, not as nuisance factors to be avoided in the simplest way possible.

Estimation and Simulation

With respect to estimation and simulation procedures, Bosworth and Duesenberry continue three traditions that I think are worthy of

more careful inspection. First, the estimation of financial market models tends to ignore the problems of simultaneous-equations bias. Second, the normalization of specific equations with respect to dependent variables is based on rather loose consideration of market-clearing and credit-rationing activities. Third, the role of macroeconomic monetary and fiscal policy is treated as exogenous in both estimation and simulation. On each of these questions, more serious attention is required. To give just one example, in a recent *Brookings Papers* study of Blinder and Goldfeld, the endogenous role of government policy is studied carefully. They are able to show that the bias in *estimation* introduced by ignoring endogenous government activity is small, whereas the interpretation of *simulation* results is greatly affected by ignoring the same factor. Further study of these problems, and implementation of the results in our models, would be an important step forward.

Conclusion

The discussion so far has accentuated the negative, both in terms of the general state of financial-market models and in terms of the B-D model which I have used as the primary example. In fact, however, I think the overall outlook is very bright, and the B-D effort illustrates just how far we have come: In terms of the specification, estimation, and simulation of their model, factors that would have been major problems five years ago are now treated with standard procedures, and the model is definitely meeting their major goals. Furthermore, the problems that do remain, both the points I have raised and the many points discussed by Bosworth and Duesenberry, are now explicitly identified. Consequently, without doubt, we should look to a continuing improvement and useful future for flow-of-funds models, and the model will be an important step along the way.