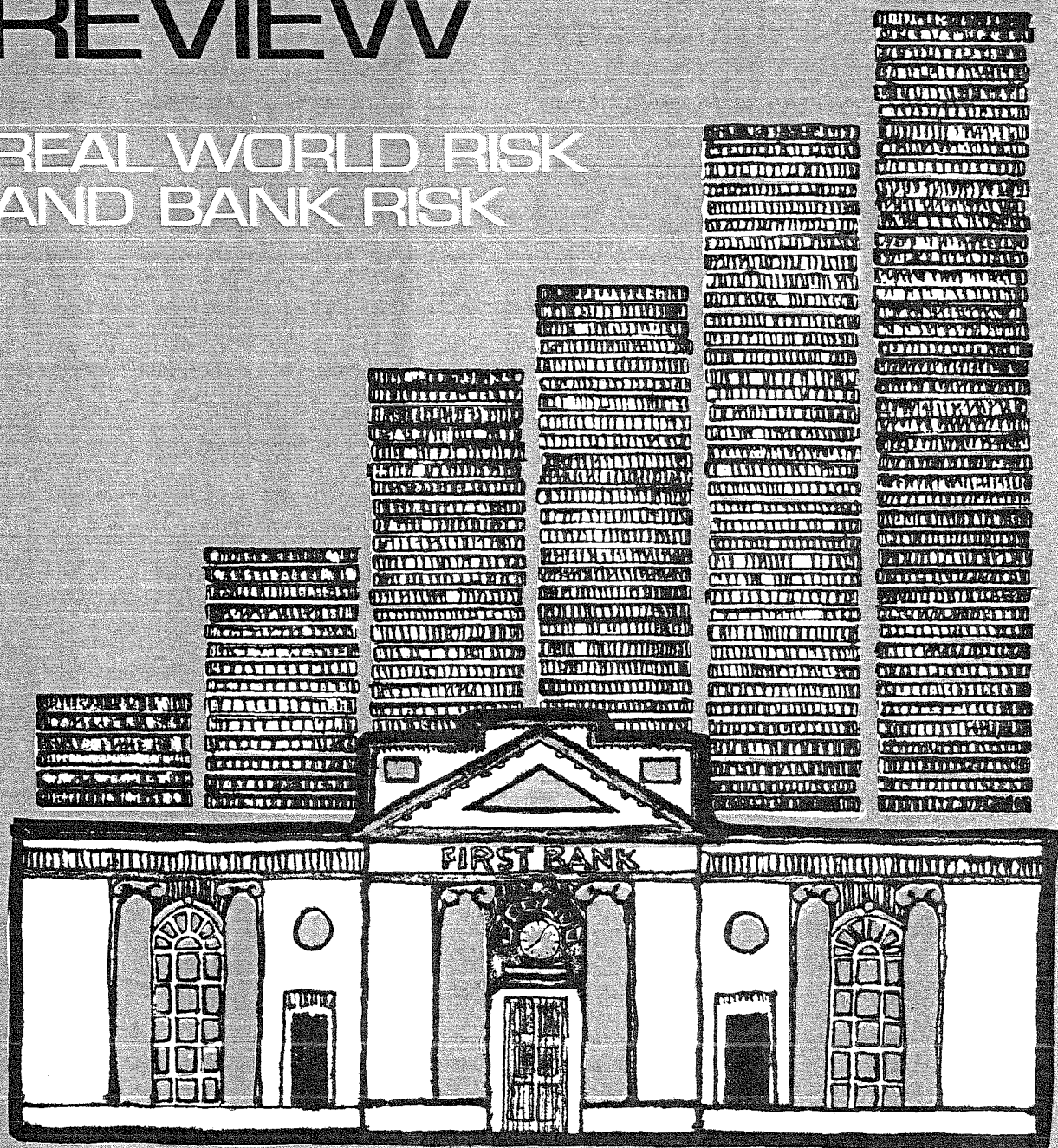


FEDERAL RESERVE BANK
OF SAN FRANCISCO

ECONOMIC REVIEW

REAL WORLD RISK
AND BANK RISK



WINTER 1977

Real World Risk and Bank Risk

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Real World Risk and Bank Risk

Inflation and related evils have severely affected financial markets and financial institutions during the 1970s, as previous issues of the *Economic Review* have described in some detail. How markets and institutions respond to the resulting risk and uncertainty is one of the key policy issues of this decade. In this issue, we address that question by focusing on the interrelationship between the real economy and the commercial-banking sector. As Herbert Runyon notes in the first article, the “real” or nonfinancial world is a much riskier place than it was ten to fifteen years ago, and this development has reflected back upon the banks.

Runyon demonstrates the growing prevalence of risk by comparing the performance of economic forecasters during the period 1971-75 with their performance during a more stable earlier period, 1961-65. He notes that serious over- and under-estimates of forecast magnitudes occurred during the early 1970s, because of several random shocks—such as wage/price controls and OPEC actions—that introduced elements of uncertainty not previously built into econometric or judgmental forecasting models. In particular, serious under-estimation of inflation marked most forecasts of the period. “The deterioration in the accuracy of forecasting results evident during this period not only provided a source of embarrassment to the forecasters themselves, but also served as a measure of the uncertainty and risk prevailing in real-world markets for labor and commodities and services, with transmitted effects felt in financial markets as well.”

Drawing from the experience of the more stable 1950s and 1960s, corporations assumed greater and greater risk by restructuring their balance sheets in favor of debt rather than equity. This higher leverage of their capital

structure left them more exposed to the decline in the return to capital and to the increase in interest rates which became so acute in the 1970s. Eventually, short-term debt amounted to two-fifths of corporate long-term debt, which meant that firms had to roll over maturing debt more frequently and thus become further exposed to financial-market disturbances.

With inflation undermining the capital markets, corporations felt compelled as never before to rely upon the banks for accommodation. Yet the risk accompanying this heavy volume of lending increased more than proportionately as banks assumed risk that normally would be shouldered by bond holders or owners of equity. And as Runyon concludes, “While the changing structure of balance sheets made corporations more vulnerable to changes in financial markets, bankers themselves were becoming bold innovators, shedding their traditional role as risk averters and becoming profit maximizers.”

Jack Beebe picks up the discussion at this point and demonstrates the extent of the shift in banking attitudes. He describes the changes in bank assets and liabilities that have occurred since World War II, relates these changes to a rise in bank exposure to market fluctuations, and uses this historical perspective to draw relevant implications for regulatory policy. “The relative decline in liquid risk-free assets, the increase in purchased short-term liabilities, the diminished capital cushions, and the increased sensitivity of bank equity prices to stock-market fluctuations all provide evidence of increased bank exposure to financial-market fluctuations.”

As Beebe notes, the data are quite striking. On the asset side, Treasury securities as a percentage of bank credit outstanding dropped from 73 percent at the end of World War II—admittedly,

a condition of abnormally high liquidity—to only 10 percent in the 1972-75 period. Meanwhile, the loan share rose from 29 percent to 70 percent of total bank credit. On the liabilities side, purchased funds increased since 1960 alone from zero to 12 percent of the overall portfolio—because of data limitations, even that is an understatement—while traditional sources of funds and capital (particularly equity capital) declined as a share of the total. The leverage ratio (total liabilities/equity capital) consequently rose from 11.0 to 13.3, and showed an even greater increase when measured relative to “risky” assets. Finally, available statistical measures indicate that bank-stock indexes have become substantially more sensitive to fluctuations in the overall stock market over the postwar period, and especially since the early 1960s.

These indicators of increased bank exposure to financial-market developments have important implications for monetary policy. “Stringent (that is, truly restrictive) limitations on purchased funds could create a severe liquidity squeeze within the U.S. commercial-banking system.” This reflects the fact that there is no large secondary market outside the commercial-banking sector for loans as there is for securities, so that loans are very difficult to sell in a liquidity squeeze. In this situation, banks generally—and not simply individual large banks—have come to rely on liability management as their principal source of liquidity.

Beebe notes that banks have purchased funds not only to stabilize the variance of bank credit during tight-money periods, but also to accelerate their growth during expansionary periods. In this respect, liability management has increased the banking sector’s exposure to financial-market fluctuations—for example, during the 1971-74 period, when banks increasingly purchased funds to meet loan commitments, but in the process accepted a relative decline in their capital cushions and liquid investments. “These measures presumably would have promised high returns in a stable economic environment but they also served to make the banking system more vulnerable in the unstable environment since 1973.”

However, liability management need not always be growth- and risk-oriented as it was during the period of rapid bank expansion through the early 1970s. Banks, in response to the double-digit inflation and recession of 1973-75, have turned liability management into a “conservative” strategy with a decline in purchased funds, slow growth in loans, and expansion of Treasury securities in bank portfolios. This episode indicates that banks learn quickly from experience, and suggests that policymakers must weigh carefully regulatory attempts to restrict the flexibility of liability management to avoid perverse effects on the commercial-banking system.

Real World Risk And Financial Institutions

Herbert Runyon*

It is a world of change in which we live, and a world of uncertainty. We live only by knowing *something* about the future. . . This is as true of business as of other spheres of activity. . .

Frank H. Knight, **Risk, Uncertainty and Profit**

The banking system has commanded more than the usual public attention during the past several years. In the process, Congress has passed legislation requiring fuller disclosure of bank assets, such as of the kinds of loans made by banks. Yet despite the sudden scrutiny of bank lending practices, many observers have overlooked the fact that banks as financial institutions have changed greatly in the past two decades. Banks have become more aggressive in seeking out lendable funds and have widened the spectrum of their borrowers, but at the cost of increased risk exposure. The greater risk has not been confined to banks alone. The “real” or nonfinancial world is a much riskier place than it was ten to fifteen years ago, and this development has reflected back upon the banks.

This increase in real-world risk has been accompanied by a growing corporate reliance upon external sources of funds. During the relatively stable period of the 1950s and 1960s, corporations restructured their balance sheets on a massive scale, substituting debt for equity and increasing the leverage of the firm. However, as the world became more risky in the 1970s, corporations found themselves more firmly locked into external financing, and hence more vulnerable to random shocks in the economy.

This paper examines the increase in real-world risk and uncertainty that appeared in the 1970s, and the effects of that increase in risk upon financial institutions and markets. Our approach is to compare the performance of economic

forecasters during the period 1971-75 with their performance during an earlier period, 1961-65, when there was a demonstrably lesser degree of uncertainty and less pressure from business upon external sources of finance, particularly the banking system.

The past several years have had a chastening effect upon forecasters. Several random shocks—the introduction of a system of wage/price controls and the imposition of an oil embargo with its concomitant quadrupling of crude oil prices—introduced elements of uncertainty and risk that had not been built into econometric forecasting models nor into the assumptions and expectations of judgmental forecasters. The deterioration in the accuracy of forecasting results evident during this period not only provided a source of embarrassment to the forecasters themselves, but also served as a measure of the uncertainty and risk prevailing in real-world markets for labor and commodities and services, with transmitted effects felt in financial markets as well.

Serious over- and under-estimates of forecast magnitudes occurred in the difficult period of the early 1970s, which culminated in the 1974-75 recession, the most severe cyclical downturn in forty years. In an evaluation of the forecasting efforts of this period, Stephen McNees argued that the forecast errors were atypical in terms of their magnitudes.¹ Accordingly, the size of the variations in realized values from anticipated values was symptomatic of the heightened uncertainty in the environment in which decision-makers functioned.

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Forecasting, Uncertainty and Risk

From the Roman augurs, who used the entrails of animals, to present-day economists, with their elaborate econometric models, men have attempted in many ways to foretell the future—and with varying degrees of success. In this paper, we use the degree of forecasting success as a measure of risk. For example, if a decision maker consistently estimates the actual values of the variables which are important to him, there is no uncertainty. But if a decision maker fails to estimate the actual values accurately, uncertainty is generated—unless, of course, the forecaster's methodology is clearly at fault.

In our analysis, we compare individual forecast observations with the actual values—whether output or prices—and also with the mean estimates of forecast. This results in two sets of comparisons which involve the dispersion of forecast observations about the actual value and the mean of forecast values, respectively. The dispersion of observations around the actual value reveals the degree of error of forecast. The distribution of forecast observations around the forecast mean says something about the relative

certainty of the forecasters as a group regarding the outlook. The basic data—annual changes in real GNP and in the inflation rate—are from the compilation of published forecast estimates made by the Federal Reserve Bank of Richmond.² The forecasts are limited to one year or four quarters ahead of the periods to which the forecasts apply. At this range, the manner in which the forecast is constructed, whether judgmental or in the form of an econometric model, is largely a matter of indifference, although it is generally agreed that judgmental forecasts have an edge within a year or less, while econometric models generally provide better results over longer periods.³

To adjust for trend, we express the estimates in terms of percentage deviation from the actual value or mean forecast value since the levels of the forecast variables had risen substantially between the two periods considered. Further, to place the results on a common footing, we compare the estimates in terms of the mean absolute error (MAE)—the average variation of the forecast observations from the actual value (or mean forecast estimate) without regard to

Mean Absolute Error of the Forecast Estimates of Real Output and the Inflation Rate, 1961-1965 and 1971-1975

	Real Output		Inflation Rate	
	MAE _A	MAE _F	MAE _A	MAE _F
1961	.025	.007	.004	.004
1962	.010	.008	.005	.003
1963	.018	.007	.003	.003
1964	.012	.007	.003	.002
1965	.029	.004	.004	.003
Total	.094	.033	.019	.015
1971	.008	.008	.007	.006
1972	.017	.007	.007	.004
1973	.013	.003	.034	.003
1974	.066	.011	.067	.009
1975	.011	.011	.009	.007
Total	.115	.040	.124	.029

algebraic sign.⁴ This simply means that we ignore whether the forecast estimates are on the high or low side of the actual value. The larger the MAE, the greater the error of forecast for that particular period.

The MAE has been calculated for the variation of the forecast observations from the mean value of the forecast estimates, MAE_F , as well as the variation from the actual values of real GNP and the rate of inflation, MAE_A (see table). A low value for the mean forecast estimate (MAE_F) implies a greater degree of consensus among forecasters regarding the outlook, since the dispersion of observations about the mean is narrow. However, a low value for MAE_F does not necessarily go hand in hand with a low value for MAE_A , which represents a "good" forecast. All the forecasters could be wrong together, so as we shall see, conviction and confidence are not sufficient conditions for successful forecasting.

MAE_A values for real GNP suggest some improvement in forecaster's ability to predict real output took place between 1961-65 and 1971-75, with the striking exception of 1974, when, with few exceptions, forecasters missed the turning point in the cycle. Still, a 6.6-percent error in forecast estimates for that year does not reflect favorably upon the forecasting fraternity, especially since it exposed decision makers to a large degree of risk. Moreover, MAE_F values for 1974 and 1975 output show a larger variance—and thus more uncertainty—than obtained in

any earlier year of the two periods considered.

For the price forecasts, the MAE_F was much smaller in each period, indicating that forecasters held a much closer consensus on price movements than they did for changes in real GNP. Also, forecasters were significantly more successful in estimating prices in 1961-65 than in 1971-75—not surprisingly since 1961-65 was part of the longest period of price stability in recent history. As Zarnowitz has shown, forecasting ability is generally good during periods of stability.⁵ From 1958 through 1965, prices increased at annual rates of $1\frac{1}{2}$ - $1\frac{3}{4}$ percent, strongly conditioning the price expectations of forecasters. Moreover, during this period of low and relatively stable inflation rates, corporations substantially restructured their balance sheets, selling debt in preference to equity under comparatively favorable conditions in the financial markets.

From 1968 through 1972, prices increased about 5 percent annually, and the expectations of decision makers gradually became geared to this rate. But then prices increased even faster, in an acceleration that was as sharp as it was unexpected, with the inflation rate reaching 13 percent at the cyclical peak in 1974. Since corporations had by this time reached a higher "preferred" leverage ratio, the resulting reliance upon debt financing made them particularly vulnerable to the rising interest rates that followed in the wake of a rapidly increasing inflation rate.

Uncertainty and Risk

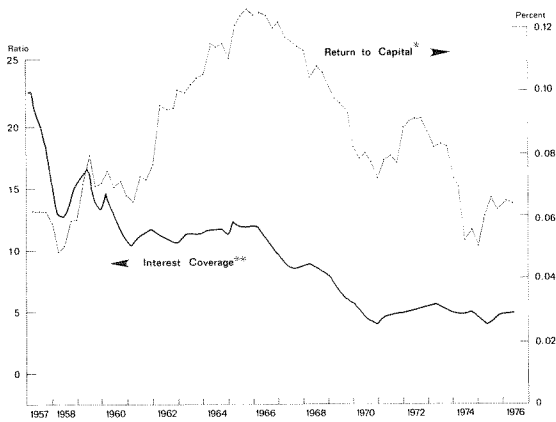
An increase in uncertainty in real markets should not impinge heavily on financial markets when corporations do not depend on them as a steady source of funding. By the 1970s, however, just such a dependence developed, as significant changes occurred in corporate balance sheets. Debt came to be used extensively in preference to equity, and leverage rose from 25 percent in 1961-65 to 44 percent in 1971-75. This increase in leverage, while it succeeded in increasing the return to common stockholders, also made corporations more vulnerable to changes in interest rates, since interest payments have a senior claim on corporate earnings. These shifts

are seen in Chart 1, which illustrates the relationships between interest coverage and the capital income share of gross corporate product. Interest coverage is defined as the ratio of profits before taxes plus net interest, to net interest; capital income is defined as corporate profits plus depreciation adjustment plus net interest.

Interest coverage remained stable at about 11 "times interest" throughout the entire 1961-65 period. Moreover, the return to corporate capital increased steadily during that period, as capital income rose from 7 percent to 10 percent of gross corporate product, providing an increasing cushion against interest claims⁶ By 1971,

Chart 1

Interest Coverage and Return to Capital



* Profits before tax plus net interest, divided by net interest
 ** Capital income as a percentage of gross domestic product of nonfinancial corporations

however, the picture changed as corporations completed the transition to a more highly leveraged capital structure. The “times interest” coverage ratio dropped sharply to a level of 5. In addition the rate of return on capital, after peaking in 1966, trended downward from over 8 percent to 6 percent during the 1971-75 period.

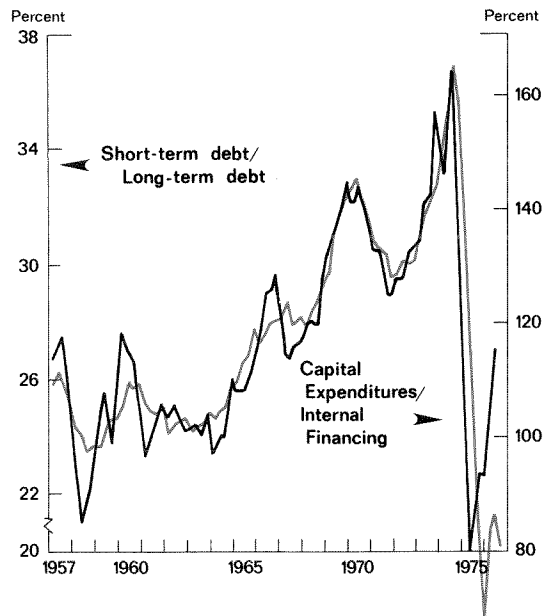
The “times interest” ratio is a worthwhile measure of risk because it measures the corporation’s interest burden in terms of the relative vulnerability or exposure of its balance sheet.⁷ Consider the relationship of the interest cover and the rate of return on capital in each period. The times interest ratio declined by more than half between 1961-65 and 1971-75, while the return on capital trended downward between these two periods. Even if interest rates could have been held constant, the corporate financial position clearly entailed more risk in 1971-75. And as will be seen later, interest rates were by no means constant.

Financing a Capital Expansion

At the same time that corporations were realigning their balance sheets to achieve greater financial leverage, they were also embarking upon an extended capital boom. These two disparate developments combined to create greater demands upon external sources of funds, especially short-term funds. In the early 1960s, the ratio of short-term to long-term debt was fairly steady, with short-term debt amounting to one-quarter of outstanding long-term debt. Subsequently, the proportion of short-term debt rose rapidly, except during the 1969-70 recession (Chart 2). The increase in the relative amount of short-term debt paralleled the increase in the proportion of capital expenditures financed externally. This might suggest that the capital expansion was financed in increasing degree by dependence upon short-term financing. However, corporations also relied heavily on short-term borrowings for inventory financing. In fact, the sharp declines in the short-term/long-term debt ratio in 1969 and again in 1975 largely reflected the declining need for short-term inventory financing during those two periods of receding economic activity.

Chart 2

Maturity Structure of Corporate Debt and Ratio of Capital Expenditures to Internal Funds



In the past 20 years, corporations not only borrowed more from banks but also rediscovered the commercial-paper market, using that alternative whenever market rates of interest were more favorable than bank rates. Corporate treasurers became increasingly sensitive to interest-rate differentials, and raised as much as possible in short-term markets whenever the interest-rate spread was favorable. In fact, they continued to rely on short-term funds even when the spread turned against them. In the early

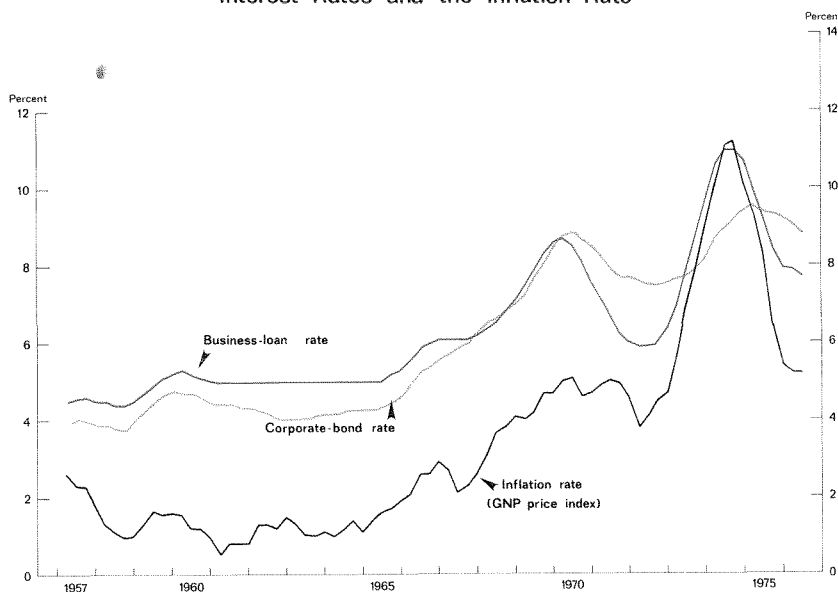
1970s, as interest rates rose to ever-higher levels, corporations elected to borrow at short-term—even at higher rates—rather than commit themselves to long-term debt obligations. This introduced another element of risk, since short-term debt must constantly be rolled over at possibly ever-higher rates. And this is precisely what happened, even while corporations increased their short-term borrowings from a cyclical low of 28 percent of total debt in 1972 to a peak of 37 percent in 1974.

Inflation and Interest Rates

Not by coincidence, interest rates and prices surged upward together during the 1971-75 period. The average long-term interest rate generally moves on a roughly parallel path with the inflation rate, with a margin between the two series representing the “real” rate of interest (Chart 3). During the 1961-65 period, when the inflation rate was in a narrow range of 1½ to 1¾ percent,

the long-term interest rate held very steady at 4½ percent. Short-term interest rates similarly are subject to inflationary expectations, although to a lesser degree because they are also strongly influenced by money-market conditions. The banks’ interest rate on short-term business loans is not market determined, being administered or set by the banks themselves, but it is still not

Chart 3
Interest Rates and the Inflation Rate*



* All series smoothed by a five-month moving average centered on the third month.

immune from market forces.

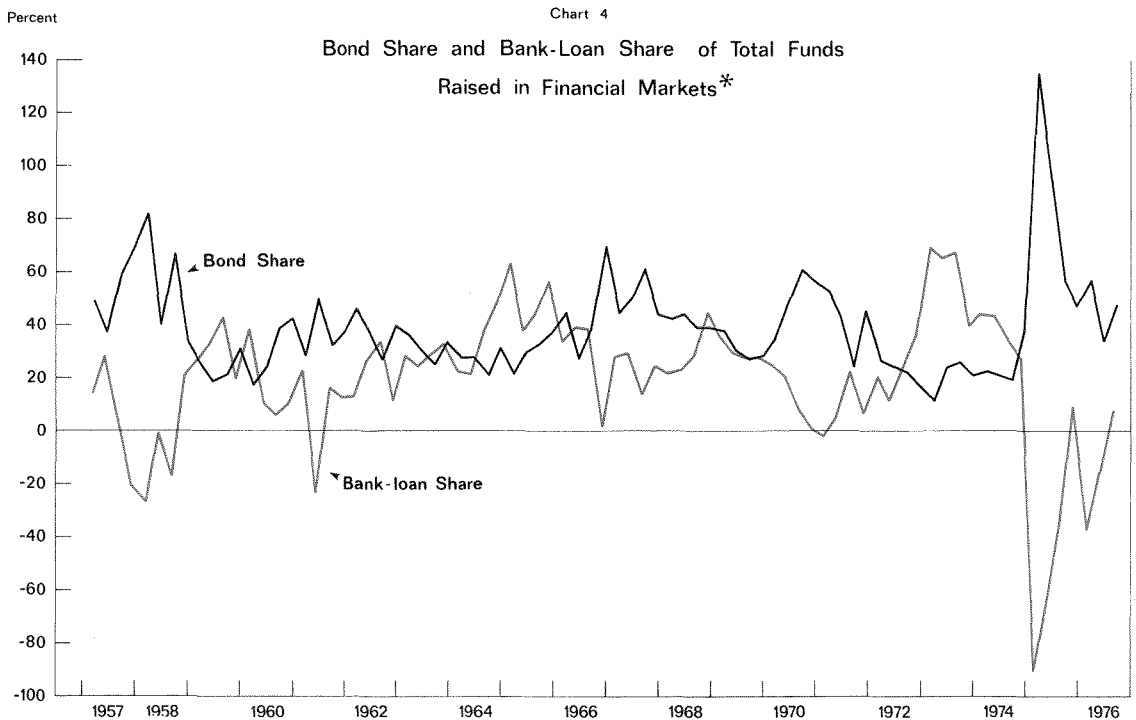
From late 1973 until the beginning of 1975, the sharply rising inflation rate substantially exceeded the long-term rate on new bond issues. In contrast, the short-term rate on business loans followed the inflation rate upward in 1974 and peaked at less than 1 percent below the inflation peak. In those circumstances, it would seem advantageous for borrowers to seek funds in the long-term market rather than from banks because of the differential in favor of long-term rates. That didn't happen, however, as borrowers turned increasingly to the banks. The explanation may be found in the special characteristics of

the 1973-74 inflation. In the words of Edward Shaw, what we experienced was "dirty" inflation—largely unforeseen and sporadic—rather than "immaculate" inflation—the type where lenders perceive perfectly the rate of inflation and thereby become compensated through the interest rate.⁸ Borrowers may have possessed less than perfect foresight as far as inflation and interest rates were concerned. But at the same time, they had doubts as to the permanence of the existing high rates and they chose to borrow short rather than long. The banks were the logical source for such funds.

Corporations and Banks

Businesses have always borrowed from banks, largely through short-term self-liquidating loans for such purposes as the purchase and carrying of inventories. However, in recent years, banks have extended the maturity of business loans, so that term loans with maturities greater than one

year now constitute about 40 percent of their business-loan portfolios. Much of this shift reflected the tendency for corporations to rely more heavily on the banks for all types of financing, including the longer-term financing shifted from the capital market.



*Percent of total net funds raised in financial markets by nonfinancial corporations.

Nonfinancial corporations increased their reliance upon banks steadily from 1970 through 1973, when nearly three-quarters of the net funds they raised in financial markets came from banks (Chart 4). The shift in 1970 and 1971 was probably prompted in some degree by the collapse of the commercial-paper market following the Penn Central debacle. But the percentage of external funds raised in the capital market also declined steadily during this period. Despite the fact that the interest rate on bank loans exceeded the rate on new bond issues, businessmen elected to borrow from banks for a few months or a few years rather than lock themselves in for longer

periods at the going interest rates prevailing in the capital market.

In 1974, the banks were almost literally "lenders of last resort," because by then the raging inflation and high rates of interest had severely crippled the capital market. Until corporations re-entered the capital markets in the easier conditions of 1975, banks provided the major source of external funds to business—and assumed a commensurate share of risk while doing so. Their assumption of a larger than ordinary amount of risky loans reflected the fact that they were lending greater amounts to a greater variety of less-than-prime borrowers.

Conclusion

The world of the early 1970s was a riskier place in which to transact business and to undertake financing than was the world of the early 1960s. The environment in which decisions were made came to be cloaked in greater uncertainty. Meanwhile, by restructuring their balance sheets in favor of debt rather than equity, corporations assumed greater and greater risk because the higher leverage of their capital structure left them more exposed to a decline in the return to capital and to an increase in interest rates. And when the amount of their short-term debt grew to nearly two-fifths of their outstanding long-term debt, corporations had to roll over maturing debt more frequently and thus became further exposed to the vagaries of the financial markets.

The inflation that made a shambles of the capital markets in 1973 and 1974 forced nonfinancial corporations to rely as never before upon the banks for accommodation. Yet the risk accompanying this heavy volume of lending increased more than proportionately as banks assumed risk that would normally be shouldered by bond holders or owners of equity. And while the changing structure of balance sheets made corporations more vulnerable to changes in financial markets, bankers themselves were becoming bold innovators, shedding their traditional role as risk averters and becoming profit maximizers. All of these developments worked together to place the financial markets and the banking system under the severest strains of the past 40 years.

FOOTNOTES

1. Stephen McNees, "An Evaluation of Economic Forecasts," **New England Economic Review**, Federal Reserve Bank of Boston, November/December 1975, p. 3.
2. The compilation includes forecasts of annual changes in real GNP and in a price series—the consumer price index for 1961-65, and the GNP implicit price deflator for 1971-75.
3. Carl F. Christ, "Judging the Performance of Econometric Models of the U.S. Economy," **International Economic Review**, February 1975, p. 57.
4. McNees, op. cit., p. 11.
5. Victor Zarnowitz, "Forecasting Economic Conditions: The

Record and the Prospect," **The Business Cycle Today**, National Bureau of Economic Research, New York, 1972, p. 195.

6. William Nordhaus, "The Falling Share of Profits," **Brookings Papers on Economic Activity**, I:1974, p. 179.

7. Herbert Runyon, "Equity Shares and the Financial Markets," **Economic Review**, Federal Reserve Bank of San Francisco, Summer 1976, p. 31.

8. Edward S. Shaw, "Inflation, Finance and Capital Markets," **Economic Review**, Federal Reserve Bank of San Francisco, December 1975, pp. 5-6.

A Perspective on Liability Management and Bank Risk

Jack Beebe*

Since World War II, U.S. commercial banks have experienced a dramatic shift in asset composition, from an aggregate portfolio consisting largely of reserves and U.S. Treasury securities to one consisting largely of loans to the private sector. Since 1960, banks have come to rely increasingly on purchased money-market funds—varying their purchases by adjusting the rates paid on these funds (“liability management”)—while simultaneously allowing their capital cushions to decline. These developments have made banks more sensitive to financial-market fluctuations and have made their liquidity depend importantly on their ability to purchase funds.

This paper examines changes in bank assets and liabilities since World War II, relates these changes to a rise in bank exposure to real and financial-market fluctuations, and uses this historical perspective to draw relevant implications for regulatory policy. The relative decline of liquid risk-free assets, the increase in purchased short-term liabilities, the diminished capital cushions, and the increased sensitivity of bank equity prices to stock-market fluctuations all provide evidence of increased bank exposure to financial-market fluctuations. Because of the increased risk exposure and because of the increased bank reliance on purchased funds as a major source of liquidity, bank regulators must weigh carefully the potentially perverse effects that liability-management restrictions (such as rate ceilings) can have on the banking sector’s

liquidity and stability. Since 1973 regulators have not used constraints on liability-management instruments as a means of tightening policy. The analysis of this paper supports this direction in policy because sudden regulatory constraints on purchased funds can cause a liquidity crisis within the U.S. commercial-banking industry. Furthermore, such constraints may not be a necessary part of monetary policy.

Increased exposure to financial-market risk does not necessarily imply that a bank’s total risk has risen. If the economy, financial markets, and regulatory policy have become more stable (less risky), then total bank risk might have declined even in the face of increasing risk sensitivity. It is generally accepted that perceived total risk in the economy and in financial markets declined over much of the postwar period through the late 1960s, and then increased in the 1970s.¹ Until recently, bankers may not have perceived any significant increase in the total risk of their portfolios. But recent developments, particularly since 1973, may well have changed this perception.

The first section of this paper discusses the theoretical linkages between assets and liabilities in the framework that considers the trade-off between expected return and risk. The second section examines postwar trends in bank assets and liabilities, along with trends in the sensitivity of bank equity prices to the stock market. The third section analyzes the impact of changes in the structure of bank assets and liabilities on the cyclical sensitivity of banks, while the final section presents the policy implications.

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I. Theoretical Linkages Between Bank Assets and Liabilities

Liability management and changes in bank-asset composition are necessarily related. However, the relationships are complex and are affected by factors external to banking—such as general economic activity, net credit demands, changing perceptions of and attitudes toward risk, and regulatory constraints. Despite these complications, portfolio theory as applied to financial institutions suggests certain broad relationships between asset and liability structures.

If commercial banks operate in competitive financial markets, then there are important implications for bank portfolios.² The spread (i.e., rate differential) between the rate earned on assets and the rate paid on liabilities must be a measure of the value of the service that banks provide. Several aspects of this service are directly relevant to the relationship between bank assets and liabilities. Among other functions, banks invest funds and make loans. In performing this function, banks gather information, forecast, and screen borrowers, and for this receive a positive spread. In addition, banks pool and at times absorb risk by placing deposit funds across a spectrum of types and maturities of loans and investments, and also absorb risk by maintaining a capital cushion. (Thus, there is risk diversification across instruments at a point in time, and risk diversification over time such as a business cycle.) To the extent that banks (or their stockholders) take on risk, there should be a compensating expected return.³ The importance of risk and the manifestation of risk diversification in bank portfolios are central to a study of changes in banking assets and liabilities.

Liability Management as a Source of Growth

Liability management has two principal motivations; it can be used both to control bank growth and to purchase liquidity. Both of these aspects imply theoretical relationships among liability management, bank assets, and bank risk.

Liability management is an effective means for a bank to control its rate of growth. Put simply, a

bank can accelerate its growth if it is willing to pay more for purchased funds than other banks do. However, a distinction must be made between the growth of a single bank and the growth of the entire banking system. As banks seek to accelerate their rates of growth, they will have to borrow additional funds from outside the banking sector. These funds may come from either of two sources: (1) an expanding level of total financial activity in the economy, or (2) an increase in the banking sector's *share* of total financial activity. The latter aspect—"bank intermediation," or simply "intermediation"⁴—is the more relevant measure in the context of this paper, which focuses on the banking sector's share of total borrowing and lending in the U.S. economy.

An individual bank can increase its share of bank intermediation by raising its rate on purchased funds marginally above that of its competitors, but when other banks follow this strategy, the effect will be to raise the market rate for purchased funds (relative to open-market rates) and to increase bank intermediation. If banks try to ensure faster growth by bidding up the rate for purchased funds (relative to other rates), they will have to seek earning assets with higher expected returns, and thereby maintain a positive spread that compensates for transaction costs and risk. Thus, as banks increasingly use liability management to gain a larger *share* of total financial market activity, they will pay relatively more for their purchased funds, and will face the increasingly difficult task of achieving a high enough spread to offset the cost involved. In a competitive market, this process will likely force banks to seek earning assets that entail higher risk and/or less liquidity.

Liability Management as a Source of Liquidity

Liability management not only enables a bank to control its growth rate, but also enables it to exert greater control over the variability of its total liabilities—for example, by increasing purchased funds to offset a loss of demand deposits.

To the extent that a bank expects to reduce such variability through liability management, it will expect a commensurate reduction in the variability of total bank credit. Thus, it can extend credit that entails greater transaction costs, greater short-term price variation, and/or less liquidity—the type of credit that financial market theory tells us should provide a higher expected yield. Therefore, an increase in liabilities *for which banks can freely vary the deposit rate* (and thus the quantity obtained) should be associated with higher-yield bank credit. In this respect, liability management provides a substitute for holding reserves, U.S. Treasury securities, or other low-yield short-term liquid assets. That is, liquidity on the liability side of a bank's portfolio (through, say, day-to-day trading in certificates of deposit or Federal funds) is a substitute for liquidity on the asset side (through, say, day-to-day trading in Treasury securities).

Although purchased funds may substitute for liquid assets, the two sources of liquidity are not perfect substitutes. First, holding liquid assets to meet future liquidity needs will normally result in different returns and risk than will holding illiquid assets with the anticipation of purchasing liquidity when needed in the future. Consider two banks, one that holds liquid (low yield) assets against demand deposits on the presumption that these assets will provide for future liquidity needs, and another that holds illiquid (high yield) assets on the presumption that, if necessary, it will later purchase funds to meet a future run-off in demand deposits. The comparative profitability of the two strategies will depend upon the ensuing financial environment. If there is no run-off in demand deposits and no liquidity squeeze, the strategy of holding illiquid assets will prove more profitable. However, if

demand deposits run off and market rates simultaneously rise, the strategy of holding liquid assets may be more profitable.

Purchased funds and liquid assets are imperfect substitutes for another reason as well. Regulatory restrictions on liability management—such as Regulation Q ceilings on certificates of deposit or increased reserve requirements on Eurodollar purchases—may effectively limit these funds as a source of liquidity to the commercial-banking sector. To the extent that banks rely on purchased funds rather than liquid investments as the primary source of liquidity, such restrictions can lead to a severe liquidity squeeze, as in 1966 and 1969-70. Although similar restrictions have not been used in the last few years, bankers cannot be certain that they will not be employed in the future. A possibility of regulatory restrictions—assuming they cannot effectively be avoided—may render liability management a poor substitute for liquid assets.

Implications for Aggregate Bank Portfolios

Both motivations of liability management—growth and liquidity⁵—suggest that an increase in the use of liability management should be associated with an increase in asset risk and/or a decrease in asset liquidity. Thus, asset composition may change in several ways, such as a decrease in marketability, increase in market-related or total risk, or increase in time to maturity. However, there is no reason that such changes should be motivated solely by changes in liability management. In fact, major changes in *asset composition* became well established prior to the changes in *liability management*. Thus, the two trends should be viewed as interrelated changes in bank *portfolio management*.

II. Postwar Secular Trends in Assets and Liabilities

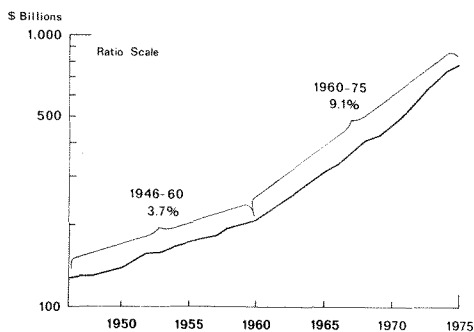
Over the 1946-60 span, bank liabilities increased rather slowly (Chart 1). The average annual growth rate, 3.7 percent per year, fell considerably below the 6.5-percent average increase in nominal GNP and the very rapid 10.5-percent growth rate for deposits at thrift institutions (savings and loan associations, mutual savings banks, and credit unions). Throughout

this span, the commercial banking sector relied principally on traditional demand and time deposits as sources of funds. Neither source expanded rapidly—2.5 percent annually for demand deposits and 5.6 percent annually for time deposits. Banks normally held their rates on individual time accounts below both the Regulation Q ceiling and S&L deposit rates. In addition,

Chart 1

Commercial Bank Liabilities*

(Year-End Outstandings, 1946-75)



* Growth rates are annual compound rates between initial and terminal years. Liabilities are net of commercial bank interbank deposits and Federal fund purchases.

Source: Flow-of-funds accounts

tion, many banks did not accept corporate time accounts.

Throughout the 1950s, most banks accepted slow growth either as sound banking practice or as something largely beyond their control. Monetary policy, regulatory constraints, and the memories of the turbulent 1930s all probably contributed to this conservative posture. However, as money-market rates rose in the 1950s, corporations began to shift their funds out of banks (particularly New York banks) and into money-market instruments. To compete effectively for corporate deposits and to acquire funds for lending, New York banks began in February 1961 to issue negotiable certificates of deposit (CD's), other city banks then followed, and security dealers began making a secondary market for these instruments.

Chart 1 shows the pronounced acceleration in the growth of bank liabilities after 1960. Over the 1960-75 span, bank liabilities increased at a 9.1-percent average rate (compared with average growth rates of 7.6 percent for nominal GNP and 10.1 percent for thrift-institution deposits). Banks arrested their earlier relative decline largely through the success of their innovations in liability management, such as large negotiable CD's, Federal funds transactions,⁶ and borrowings from foreign branches (Eurodollars). Other contributing factors included favorable monetary and regulatory policies, which until the late 1960s did little to inhibit the growth of purchased funds, and the reduction in the hitherto very

rapid thrift-institution growth through the extension of Regulation Q to thrift-institution deposits in 1966.

Despite sharp declines during the 1966 and 1969 credit crunches and the 1970 recession, bank liabilities grew very rapidly from 1961 through mid-1974 as a whole. This period experienced relatively rapid economic growth and a strong rise in private—both consumer and business—spending and debt. But in addition, the banking sector's intermediary role increased significantly, reversing the earlier decline. As shown in Chart 2, bank intermediation declined from over 31 percent in 1946 to 26 percent in 1960, but then rose to 32 percent by the end of 1974 before declining somewhat again.

Secular Shifts in Bank-Asset Composition

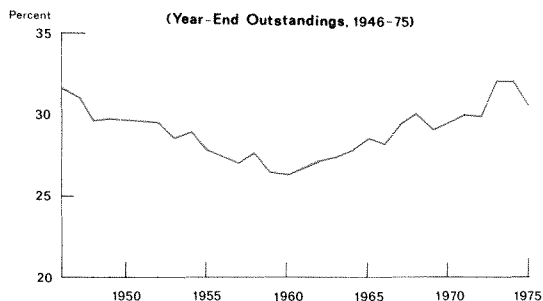
The composition of bank assets has changed dramatically over the postwar span. Non-earning assets, vault cash and member-bank reserves, have risen at a sluggish pace, principally because (1) a slow increase in demand deposits has led to a net reduction in the effective required-reserve ratio and (2) more effective reserve management, motivated by rising interest rates, has reduced aggregate excess reserves. Thus, earning assets have risen from about 85 percent of bank assets in 1945-48 to about 90 percent in 1972-75.

Of greater consequence, however, has been the pronounced postwar shift in the composition of earning assets. Marketable U.S. Treasury securities declined from an average of 63 percent of aggregate bank credit outstanding in the 1945-48

Chart 2

Bank Intermediation - Stocks*

(Year-End Outstandings, 1946-75)



* Commercial bank credit market instruments outstanding as a share of total nonfinancial credit market debt.

Source: Flow-of-funds accounts

period to an average of 10 percent in the 1972-75 period. Other governments—state, local and Federal agency—increased their share of bank credit outstanding from 5 to 19 percent over the same time span, and in particular, the loan share of the total jumped from 29 to 70 percent.

Banks entered the postwar era with what in retrospect can be considered abnormally high liquidity. At the end of 1945, U.S. Treasury securities constituted 73 percent of bank credit outstanding. Thus, banks were able to accommodate a substantial increase in loan demand by liquidating Treasuries, reducing their holdings from \$91 billion in 1945 to \$61 billion in 1960. Since 1960, the Treasury share of bank credit has continued to decline from 30 percent to only 10 percent in 1972-75. This period also marked the spread of liability management, and with minor exceptions (until late 1974) was characterized by heavy demand for private credit. In this environment banks were willing, if not anxious, to accommodate a rising market for bank loans by purchasing funds and simultaneously reducing their cushion of liquid secondary reserves (and capital accounts). Bankers may have been consciously taking additional risk with the expectation of greater reward. But in addition, in view of the apparent decline in perceived market risk in U.S. financial markets, bankers may not actually have been aware of any substantial rise in their

total risk. In any case, bank asset structures became increasingly susceptible to financial-market fluctuations, despite the fact that liability management also provided (in theory) a buffer to offset asset illiquidity.

Contrasted to the declining share of U.S. Treasury securities was the growing postwar importance of Federal agency and state-local government issues. Treasury and agency issues may be considered substitutes for each other, but the latter carry some additional default risk and may be of longer maturity. Municipal securities may carry substantial default risk and vary widely in maturity. Thus, the shift in security holdings from U.S. Treasury to Federal agency and state-local government securities should be viewed as a shift away from liquid low-risk assets.⁷

Secular Trends in Liabilities and Capital Positioning

Postwar developments in liability management and capital structure are reflected in a change in the composition of aggregate bank liabilities, as shown in Table 2. (Large-bank data show more striking changes in liabilities, as they do for assets, but the emphasis here is on the total commercial-banking sector.) During the 1950s, bank liabilities consisted of equity capital and

Table 1
Secular Changes in the Composition of
Bank Credit Outstanding
Percentage of Total Loans and Investments, 1952-75

	Loans ¹					Investments			
	Total	C&I	Real Estate	To Individuals	Other	Total	U.S. Treas.	S.&L. Gov't.	Other ²
1952-55 ³	46.3	18.8	11.7	9.7	6.2	53.6	42.6	7.6	2.6
1956-59	54.6	22.1	13.7	11.6	7.2	45.4	34.2	8.4	2.1
1960-63	59.1	21.0	14.6	13.2	10.2	40.9	28.6	10.0	1.8
1964-67	65.4	23.6	16.3	14.8	10.8	34.5	19.2	13.0	2.4
1968-71	67.3	25.2	16.6	15.1	10.4	32.7	13.9	15.3	3.5
1972-75	70.0	24.8	18.0	15.0	12.3	30.0	9.8	14.9	5.4

¹ Equals "other loans" in *Federal Reserve Bulletin*, i.e., excludes Federal funds sold and securities purchased under agreements to resell.

² Consists mostly of securities issued by Federal agencies.

³ Averages of semi-annual call data over each four-year period.

Source: *Federal Reserve Bulletin*, assets of all commercial banks.

"traditional" sources of funds—net demand deposits, time deposits other than large CDs, and small amounts of Federal Reserve float and borrowing from Federal Reserve banks. Equity capital *increased* as a portion of total liabilities during the 1950s. But since 1960, purchased funds have risen from zero to 12 percent of the overall portfolio, while traditional sources of funds and capital (particularly equity capital) have declined as a share of the total.

Because of data limitations, Table 2 understates the growing importance of liability management. First, it includes among "traditional" sources the rapidly-growing category of time deposits other than large CDs, although the distinction between the time deposits and large CD categories has become increasingly fuzzy, particularly since Regulation Q ceilings no longer apply to some time-deposit categories. In addition, the table includes only part of the rapid increase of purchased funds transacted through holding companies, and excludes certain "off-balance sheet" items such as arbitrage transactions through agencies of foreign banks.

Despite data limitations, the figures in Table 2 show both a rapid increase in the importance of purchased funds and a decline in the equity (and total capital) base since 1960. When viewed as a source of liquidity, the increase in purchased

funds from zero to 12 percent of the portfolio is very important. Likewise, when viewed in terms of leverage, the small decline in equity from 9.1 to 7.5 percent of total liabilities is also important. This change represents an increase in the leverage ratio (total liabilities/equity capital) from 11.0 to 13.3. If measured relative to "risky assets," leverage has of course shown an even greater increase. (Again, the change has been greater for large banks than for others.) Thus, between 1960 and late 1974, we have witnessed two striking secular trends—an increase in purchased funds and a decline in banks' capital cushion—along with the decline in asset marketability mentioned earlier.

Although the compositional shift from liquid assets to illiquid assets (Table 1) was well established prior to the advent of liability management (Table 2), the developments were closely related. On the asset side, rising interest rates, high private demand for bank loans, small Federal deficits, and a gradual waning of Depression fears led banks to reduce noninterest-bearing reserves and shift funds from liquid investments to (high yield) loans. On the liability side, rising interest rates (combined with Reg Q ceilings) and a favorable economic environment provided the incentive for banks to move more aggressively into financial markets by purchasing more funds

Table 2
Secular Changes in the Composition of Commercial Bank Liabilities¹
Percentages of Total Liabilities, 1952-75

	Traditional Sources			Purchased Funds				Capital			
	Total ²	Demand Dep., Net	Time, Excl. Large CDs	Total ³	Large CDs ⁴	Federal Funds, Net ⁵	Eurodollars	Total	Equity	Debt	Misc.
1952-55 ⁶	89.3	62.4	26.3	0.3	0.0	0.0	0.3	8.0	8.0	0.0	2.4
1956-59	88.0	57.7	29.5	0.1	0.0	-0.1	0.2	8.7	8.7	0.0	3.2
1960-63	85.5	51.0	33.6	2.3	1.9	0.0	0.4	9.1	9.1	0.0	3.2
1964-67	82.0	42.4	38.9	5.7	4.6	0.4	0.7	8.8	8.4	0.4	3.4
1968-71	79.0	37.2	41.0	7.3	4.8	1.0	1.4	8.5	8.0	0.5	5.2
1972-75	73.8	30.9	42.4	12.2	9.3	2.1	0.4	8.1	7.5	0.6	5.9

¹ Liabilities are net of interbank demand deposits and interbank Federal funds purchases.

² Includes borrowing from Federal Reserve banks and Federal Reserve float, not shown separately.

³ Includes loans sold to holding companies, loans from foreign banking agencies, and time accounts at foreign banking agencies, not shown separately.

⁴ Negotiable CDs over \$100,000.

⁵ Consists of security RP's and float on commercial bank interbank loans.

⁶ Averages of year-end outstandings.

Sources: Flow of funds accounts for all items except equity capital which is from **Federal Reserve Bulletin**.

for bank lending. Furthermore, banks utilized purchased funds to provide some of the balance-sheet flexibility lost through the compositional shift in assets.

Stock Market Evidence of Bank Risk

These interrelated developments—the decline in asset liquidity, the growth of liability management, and the decline in bank capital—suggest that U.S. banks have become more exposed to risk, particularly the risk associated with general economic and financial conditions.

There is a way to test this proposition. Financial theory makes wide use of the “market model” and the concept of “beta.”⁸ Using the market model, returns of an individual security (or group of securities) are regressed against the returns in the overall stock market to determine the extent to which the individual security (or group of securities) is sensitive to overall stock-market fluctuations. (The model is shown in the notes to Table 3.) The stock market is represented by a broad index such as the Standard and Poor’s Composite of 500 stocks (S&P 500). The resulting beta value is a measure of the sensitivity of the return of the individual security to the

return in the market. For example, if a stock has a beta of 0.5 (perhaps a utility stock), we should expect on average for a 10-percent change in the level of the stock market to result in a 5-percent change in this stock’s price. In contrast, if the beta is 1.5 (an airline stock), the same market return would result in a 15-percent change in the stock’s price on average. (By definition the average stock’s beta is 1.0.)

It is well known that the stock market is highly influenced by expectations regarding the general economic and financial environment. If banks are insulated from this environment, bank stocks should not be very sensitive to factors that affect the overall stock market and bank stocks should have a low beta. Estimated betas for Standard and Poor’s stock index of nine New York City and sixteen large banks outside New York City show that this was indeed the case for the post-war period through the 1950s (Table 3). However, since about 1960 these bank-stock indexes have become substantially more sensitive to fluctuations in the overall stock market (S&P 500). Since the stock market generally reflects anticipated business and financial conditions, these data suggest that common stocks of large

Table 3
Betas of Standard and Poor’s Bank-Stock Indexes Against the S&P 500^{1/}

	9 NYC Banks			16 Banks Outside NYC		
	Beta	Std. Error of Beta	\bar{R}^2	Beta	Std. Error of Beta	\bar{R}^2
1947-49	.39	.10	.31	.56	.16	.25
1950-52	.36	.12	.18	.47	.13	.26
1953-55	.37	.12	.19	.35	.12	.18
1956-58	.37	.11	.22	.50	.10	.41
1959-61	.63	.17	.28	.49	.12	.31
1962-64	.98	.11	.69	1.06	.09	.81
1965-67	.89	.23	.28	.74	.18	.32
1968-70	1.11	.17	.53	1.09	.14	.63
1971-73	.68	.19	.25	.78	.14	.47
1974-76 ²	1.09	.18	.52	1.22	.18	.59

¹ Based on rates of change in last-Wednesday-of-the-month prices after 1952 and monthly-average prices for preceding periods. The regression model is:

$$\ln(P_{\text{banks}, t+1} / P_{\text{banks}, t}) = a + b \ln(P_{500, t+1} / P_{500, t}) + e$$

² Data for 1976 are through August.

Source: Standard and Poor’s price indexes for 9 NYC banks, 16 banks outside NYC and composite of 500 stocks.

banks have become more sensitive to the economic and financial climate in the past several decades.

The betas of these bank-stock indexes rose primarily between the late 1950s and early 1960s and have since fluctuated around the higher level. The R-squared values also rose during these intervals of rising beta, indicating a closer association between changes in these stock series

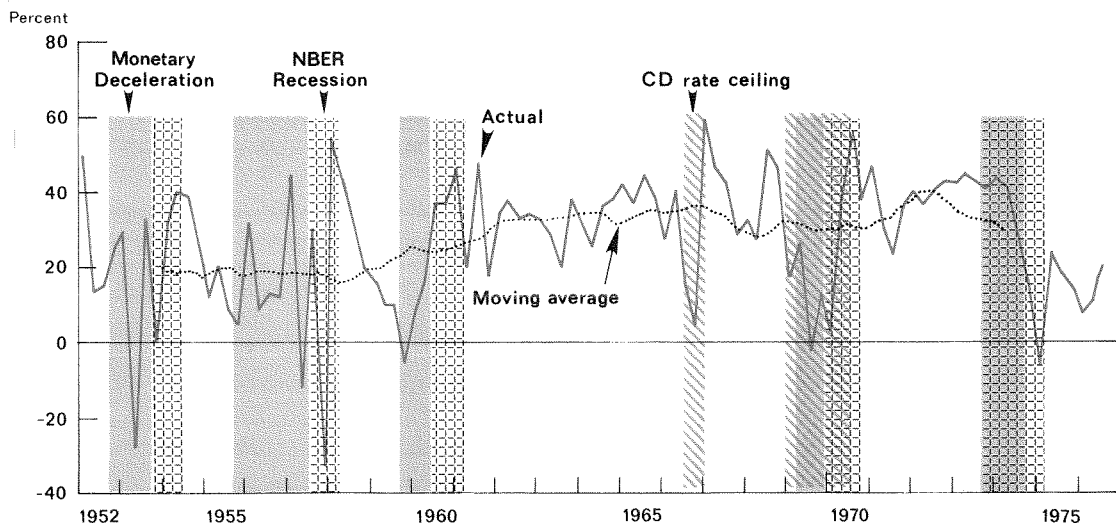
III. Liability Management and the Cyclical Stability of Banking

An important question raised by the developments discussed above is whether the liquidity provided by liability-management (purchased) funds can compensate for the decline in asset marketability experienced over the postwar period. If banks can stabilize the short-term variation in total liabilities (by varying the rate paid on purchased funds), then liability management can reduce the risk inherent in declining asset marketability. If purchased funds have actually served this function, then we should expect to see a reduction over time in the short-term variation of total bank liabilities, and therefore greater cyclical stability in bank credit. Is there any evidence that bank credit has become more cyclically stable?

and changes in the overall stock market and indicating that a greater percentage of their total price fluctuations is now market-related. The shift between the 1950s and 1960s occurred as large banks aggressively moved into the money markets to purchase funds, extended their loan commitments rapidly, and allowed their equity leverage to rise.

Some evidence is provided by the pattern of bank intermediation—the share of total nonfinancial-sector borrowing provided in the form of commercial-bank credit (Chart 3). (The measure in Chart 3 is based on flows and is thus more sensitive to cyclical variation than is the measure based on stocks in Chart 2.) The movement of quarterly data reveals two important characteristics. First, there is a good deal of variability throughout the entire period. Analysis of the two underlying series that form the ratio shown in Chart 3 shows that both the flow of bank credit and the flow of total funds raised by nonfinancial sectors vary considerably and are highly correlated, but that the flow of bank

Chart 3
Bank Intermediation-Flows
(1952:1-1976:3)*



* Quarterly flows of commercial bank credit market instruments as a share of total funds raised by nonfinancial sectors including new equity issues. Sources: Actual data from flow-of-funds accounts. Dating of periods from Poole for periods of monetary deceleration, NBER for recessions, and Friedman for periods when CD rate exceeded ceiling rate.

credit is by far the more volatile series. Thus, the flow of bank credit is more sensitive to changes in economic and monetary conditions than is total borrowing in the economy, and larger relative changes in the flow of bank credit are the principal cause of variations in the extent of intermediation.

The second characteristic is the shift in the pattern of quarterly deviations after 1961. Quarterly stability was practically nonexistent prior to that year. In contrast, the period since 1961 is marked by spans of relative stability interrupted by a few intervals of extreme instability. This change in the pattern of stability may be attributed in part to liability management, or it may be the result of changes in economic conditions and in monetary policy, including effects of Reg Q.

Because of the influence of monetary and economic conditions on bank intermediation, it is necessary to examine liability management and the stability of bank credit in a framework that recognizes broad changes in these external factors. Specifically, we may ask whether liability management has enabled the banking sector to stabilize the degree of bank intermediation during periods of "tight money." Although there is no commonly accepted method of defining tight money periods, two criteria provide a rough approximation: (1) a deceleration in the growth rate of money (M_t) preceding business cycle peaks,⁹ and (2) the existence of binding ceiling rates on CDs, with secondary-market rates rising above the allowed ceiling rate on new CDs. According to these criteria, there have been six tight-money periods since 1952, separable into three different categories: (1) pre-liability management (i.e., prior to 1961), (2) liability management with constraints (the 1966:3-1966:4¹⁰ and 1969:2-1969:4 periods), and (3) liability management without constraints (the 1973:4-1974:3 period). The latter distinction arises because, in the last several years, monetary policy makers have ceased using such constraints as ceilings on large CDs and high reserve requirements against Eurodollar deposits.¹¹

During two of the three pre-liability-management periods of monetary restraint, disintermediation was substantial, while during the other it was modest—although highly variable

within the period (Table 4 and Chart 3). Later, during the 1966 and 1969 periods, when liability management was constrained by effective Reg Q ceilings, disintermediation was severe despite attempts by banks to circumvent restrictions. In sharp contrast, during the one recent period of monetary restraint in which liability management was not constrained (1973:4-1974:3), bank intermediation was exceedingly high (38 percent, compared with the 1972-75 average of 32 percent). In this last period, bank intermediation did not decline significantly until the onslaught of the "inventory" recession in late 1974. Thus, there is strong evidence that *unconstrained* liability management can enable banks to maintain intermediation during periods of monetary deceleration.

Table 4

Bank Intermediation—Flows

<u>Four-Year Averages</u>	<u>Percentage</u>
Before Liability Management	
1952-55	20.0
1956-59	17.2
After Liability Management	
1960-63	30.8
1964-67	34.8
1968-71	30.2
1972-75	32.3
<u>Periods of Monetary Deceleration and/or Binding CD Rate Ceilings</u>	
Before Liability Management	
1952:4-1953:2	10.7
1955:4-1957:2	17.1
1959:4-1960:2	6.2
Liability Management With Constraints	
1966:3-1966:4	9.2
1969:2-1969:4	12.6
Liability Management Without Constraints	
1973:4-1974:3	38.3

Data definitions and source: See Chart 3.

This evidence can be supported by a more detailed examination of changes in major bank assets and liabilities (Table 5). In this analysis, bank credit is divided into loans and investments, and liabilities into traditional sources (net demand deposits, time deposits other than large CDs, borrowing from Federal Reserve banks, and Federal Reserve float) and other liabilities (principally purchased funds and capital).

If purchased funds are to stabilize total bank credit in periods of monetary restraint, their growth rates should increase (or not decrease as much as those of traditional sources). Actually, "other liabilities" increased rapidly during the pre-liability management periods of monetary restraint, at a 3.3-percent average quarterly rate of increase. Although perplexing at first glance, this has a straightforward explanation, since the increase was almost entirely in equity capital (which includes retained earnings) and bank profits were high in these periods. Loan growth was not unduly restrained during these periods, because funds were available from other liabilities (particularly equity capital) and from net liquidation of investments.

In contrast, severe bank disintermediation occurred during the 1966 and 1969 periods of constrained liability management. For these periods on average, traditional sources grew slowly, 0.6 percent quarterly, compared with a 1.9-percent average for the 1961:1-1976:3 span. The growth rate of other liabilities (0.8 percent) was also low—especially low compared with a 4.6-percent average for 1961:1-1976:3. Consequently, during the 1966 and 1969 tight-money periods, controls on purchased funds reduced the increase in these funds far below normal, so that loan growth was severely restricted despite the liquidity provided by net sales of investments.

The 1973:4-1974:3 period of monetary deceleration, in which Regulation Q ceilings were effectively removed, shows an entirely different pattern. Bank growth was rapid over this period. Other liabilities increased at a whopping 7.0-percent quarterly average rate, while loan growth averaged 3.2 percent quarterly. In addition, there seemed to be little need to liquidate investments to meet loan demand, since purchased funds fulfilled this function. (Of course,

banks no longer had much flexibility for liquidating investments, since Treasury securities and other investments had already been reduced to only a small share of total bank assets.)

Table 5

Average Quarterly Rates of Change in Major Commercial Bank Assets and Liabilities*

	Average Secular Rates	
	Pre-Liability Mngt. 1952:1-1960:4	Post-Liability Mngt. 1961:1-1976:3
Bank Credit	1.2%	2.2%
Loans	2.0	2.4
Investments	0.3	1.8
Liabilities	1.0	2.2
Trad. Sources	0.9	1.9
Other Liab.	3.0	4.6

	Average Rates In Periods of Monetary Restraint		
	Pre-Liab. Mngt.	Post-Liability Management	
	1952:4-1953:2 1955:4-1957:2 1959:4-1960:2	Constrained 1966:3-1966:4 1969:2-1969:4	Unconstrained 1973:4-1974:3
Bank Credit	0.6%	0.6%	2.6%
Loans	2.4	1.5	3.2
Investments	-1.2	-1.1	1.1
Liabilities	0.5	0.6	2.8
Trad. Sources	0.4	0.6	1.7
Other Liab.	3.3	0.8	7.0

*Average percentage changes at quarterly rates in seasonally adjusted quarterly outstandings.

Definitions:

Total Bank Credit: Total bank credit (net of interbank deposits and Federal funds transactions).

Loans: Sum of mortgages, consumer credit, bank loans, n.e.c., and security credit.

Investments: Total bank credit minus loans as defined above.

Total Liabilities: Total liabilities (net of interbank deposits and Federal funds purchases).

Traditional Sources: Sum of net demand deposits, time deposits other than large negotiable CDs, borrowing from Federal Reserve banks, and Federal Reserve float.

Other Liabilities: Total liabilities minus traditional sources as defined above.

Source: Flow of Funds Accounts.

Recent Reversal in Liability Management

The rapid increase in purchased funds and expansion of bank loans to mid-1974 ultimately proved destabilizing to the bank sector, given the (unforeseen) recession in late 1974. But there is no reason that unconstrained liability management must always result in increased risk. The expansion following the inventory recession of 1974:4-1975:1 has been one in which earlier trends in liability management have been reversed and bank portfolios have become less risky, as seen in the following table. (The figures may be compared with those in Table 5, top.)

	Quarterly Change (%) 1975:2-1976:3
Bank Credit	1.4
Loans	0.5
Investments	3.3
Liabilities	1.4
Traditional Sources	2.0
Other Liabilities	-0.6

In contrast with the overall 1961-74 period, total bank credit and total liabilities have increased slowly. Loans have been nearly flat, but investments (especially marketable Treasury issues) have increased markedly. Deposits (excluding large CDs) have accelerated, while other liabili-

ties have actually declined because of a marked drop in the amount of purchased funds.

Three questions immediately come to mind. Are we reverting back to a 1950-style pattern of bank portfolios and capital structures? Is the recent reversal attributable largely to forces external to banking (i.e., regulatory, economic or financial changes) or rather to a concerted effort on the part of bankers to reduce the risk exposure of their portfolios? Is the shift a precursor of future banking trends or is it merely transitory?

Answers to these questions extend beyond the boundaries of this paper, but some response is merited. First, despite the significance of these developments, casual analysis suggests that the recent conservative trend has not moved major liquidity and capital ratios back beyond where they were in the early 1970s. The second question has stirred considerable controversy,¹² but no final answers can be reached until we assess the relative importance of the factors—regulation, economic trends, and bank portfolio management—that have been instrumental in the recent reversal in trend. The same considerations will determine the answer to the third question—the permanency of this recent shift in bank behavior.

IV. Conclusions—Policy Implications

This paper has attempted to show that the liquidity and stability of U.S. commercial banks have become more sensitive to economic and financial-market risk over the postwar span. This trend has resulted primarily from changes in bank portfolio management, on both the asset and liability sides.

The marked reduction in liquidity of bank assets over the postwar period has implications both for liability management and for monetary policy. Declining liquidity has been reflected in the shift in assets away from noninterest-bearing reserves and secondary reserves (U.S. Treasury securities). Although this trend has been partly offset by increased purchases of U.S. agency and state-local government securities, the most important development has been the sharp increase in loans to the private sector. Clearly, this com-

positional shift in assets has reduced asset marketability on balance.

Bank growth accelerated rapidly after the advent of liability management in 1961, and subsequently (until late 1974) banks relied increasingly on purchased funds for both growth and liquidity. With purchased funds available, banks had an additional incentive to reduce asset liquidity. Banks—particularly large banks—presumably considered holding additional liquid assets to be a costly alternative to purchasing liquidity. Thus, the compositional shift in bank assets and the expansion of liability management can be seen to be closely interrelated.

Trends in bank asset and liability management cannot be appraised independently of the economic environment in which they occur. Bank portfolios are structured within a framework

that depends largely upon expectations of risk and return. Although this paper has not examined postwar trends in total economic and financial risk, it is readily apparent that the banking sector's exposure (sensitivity) to such risk has risen. The relative decline of "risk free" assets (reserves and short-term Treasury issues), the relative decline of "interest insensitive" (traditional) deposits, the diminishing capital cushion of banks, and the rise of bank-stock betas all provide evidence of increased exposure to financial-market developments.

These considerations together have important implications for monetary policy. Stringent (that is, truly restrictive) limitations on purchased funds could create a severe liquidity squeeze within the U.S. commercial banking system. This is related to the fact that there is no large secondary market *outside the commercial bank sector* for loans as there is for securities. While there is a wide market for Treasury bills, most loans would be very difficult for a bank to sell in a liquidity squeeze. In this situation, the banking sector as a whole—and not simply individual large banks—has come to rely on liability management as its principal source of liquidity.

Given this fact, it is not surprising that banks devised ingenious instruments to circumvent CD ceilings during the 1966 and 1969 tight-money periods. Despite these efforts, bank disintermediation was heavy during those periods. Although it is difficult to assess the effects of liability-management curbs on total financial

flows and total spending in the economy, the effect on the banking system was obviously disruptive.

Banks have purchased funds not only to stabilize the variance of bank credit during tight-money periods, but also to accelerate their growth during expansionary periods. In this respect, liability management has increased the banking sector's exposure to economic fluctuations. During the 1971-74 period, banks increasingly purchased funds to meet loan commitments, but in the process allowed their capital cushions and liquid investments to decline in relative terms. These measures presumably would have promised high returns in a stable economic environment, but they also served to make the banking system more vulnerable in the sharp recession at the end of 1974.

Policy-makers henceforth will be forced to weigh carefully any perverse effects on the commercial-banking system resulting from policies that attempt to restrict the flexibility of liability management. Actually, it is not clear that monetary policy needs to resort to such tactics, or even that restrictions of this type effectively curb economic spending. The 1973-74 tight-money period occurred without any resort to direct controls over liability management. This period of monetary deceleration may or may not have brought on the ensuing inventory recession, but the recession occurred without any prior curbs on liability management or severe disintermediation of bank funds.

FOOTNOTES

1. See the paper by Herbert Runyon in this issue. Additional evidence from varied sources supports this view. The P/E ratio in the stock market rose considerably in the late 1950s and early 1960s, and ignoring fluctuations of short duration, did not fall dramatically until 1973. In addition, monthly variation in stock market (S&P 500) returns generally declined through the late 1960s and then rose during the 1970s. Studies cite a number of possible explanations for a postwar decline in the market's perception of risk. William Nordhaus, "The Falling Share of Profits," *Brookings Papers on Economic Activity* (No. 1, 1975), pp. 198-204; Henry Wallich, "Framework for Financial Resiliency," Conference on Financial Crises, New York University, May 21, 1976; and Stuart I. Greenbaum, "Economic Instability and Commercial Banking," Hearings of the Senate Committee on Banking, Housing and Urban Affairs, 94th Congress (October 31 and December 1 and 8, 1975).
2. Many commercial banks operate in markets that are not highly competitive, largely because of regulations that often restrict entry of new banks or prohibit branch banking. Measured by dollar volume, however, most transactions take place in competitive markets, as a result of the sheer dollar volume of transactions at large city banks and the system of correspondent banking.
3. Financial theory suggests that (given diversified portfolios) the pertinent risk to be considered is market-related and not firm-specific, from the standpoint of either bank portfolios or loan differentials. Small banks do not hold diversified loan portfolios, in part because loans are concentrated in the local geographical area—and their risk is thus partly firm-specific—but the most important problem for the commercial bank sector as a whole is market-related risk.
4. The term "intermediation" is used throughout to mean the commercial banking sector's share of financial-market activity. Two closely related measures are used—one based on banks' share of total financial market **flows** (lending and borrowing) and one based on banks' share of **stocks** (total assets or liabilities) in the financial markets.
5. This paper ignores a third reason for liability management: legal avoidance of reserve requirements. New instruments have normally been subject to reserve requirements only with some time lag.
6. Banks had traded Federal funds among themselves in earlier years, but had purchased only insignificant amounts from outside the commercial banking sector until the mid-1960s.
7. There are additional reasons for the rapid increase in bank holdings of state-local government obligations. For one reason, there was probably much less perceived risk on municipal issues than there had been during the Depression of the 1930s. Banks bought such issues also because of their strong ties with local governments, or because of legal restrictions requiring the pledging of government issues against deposits. Finally, banks purchased municipals because they gained a comparative advantage from the tax-exempt status of such issues, although this factor is now declining in importance because other means are available of obtaining credits against taxable income.
8. The market model and beta are described in recent textbooks on finance and investments. A short description is also contained in Franco Modigliani and Gerald Pogue, "An Introduction to Risk and Return," *Financial Analysts Journal*, March/April and May/June 1974.
9. William Poole, "The Relationship of Monetary Decelerations to Business Cycle Peaks," *Journal of Finance* (June 1975). The Poole study ended prior to the recent recession, so some judgment had to be made about this period. Although the NBER dates the recent business-cycle peak within the fourth quarter of 1973, the sharp "inventory recession" did not take effect until late 1974. This study concentrates on the inventory recession that occurred over the 1974:4-1975:1 period, because inventory purchases and short-term credit demands remained strong until this time. Using Poole's criterion and this recession dating, monetary deceleration "prior to a business-cycle peak" occurred over the 1973:4-1974:3 period.
10. The period of effective CD ceilings in late 1966 coincided with a deceleration in the growth of money. However, since an NBER recession did not follow, the period did not meet Poole's criterion.
11. For exact restrictions and dates of removal, see tables in any issue of the **Federal Reserve Bulletin**.
12. See the contributions of Gilbert, Harris, and Kaufman listed in the bibliography.

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