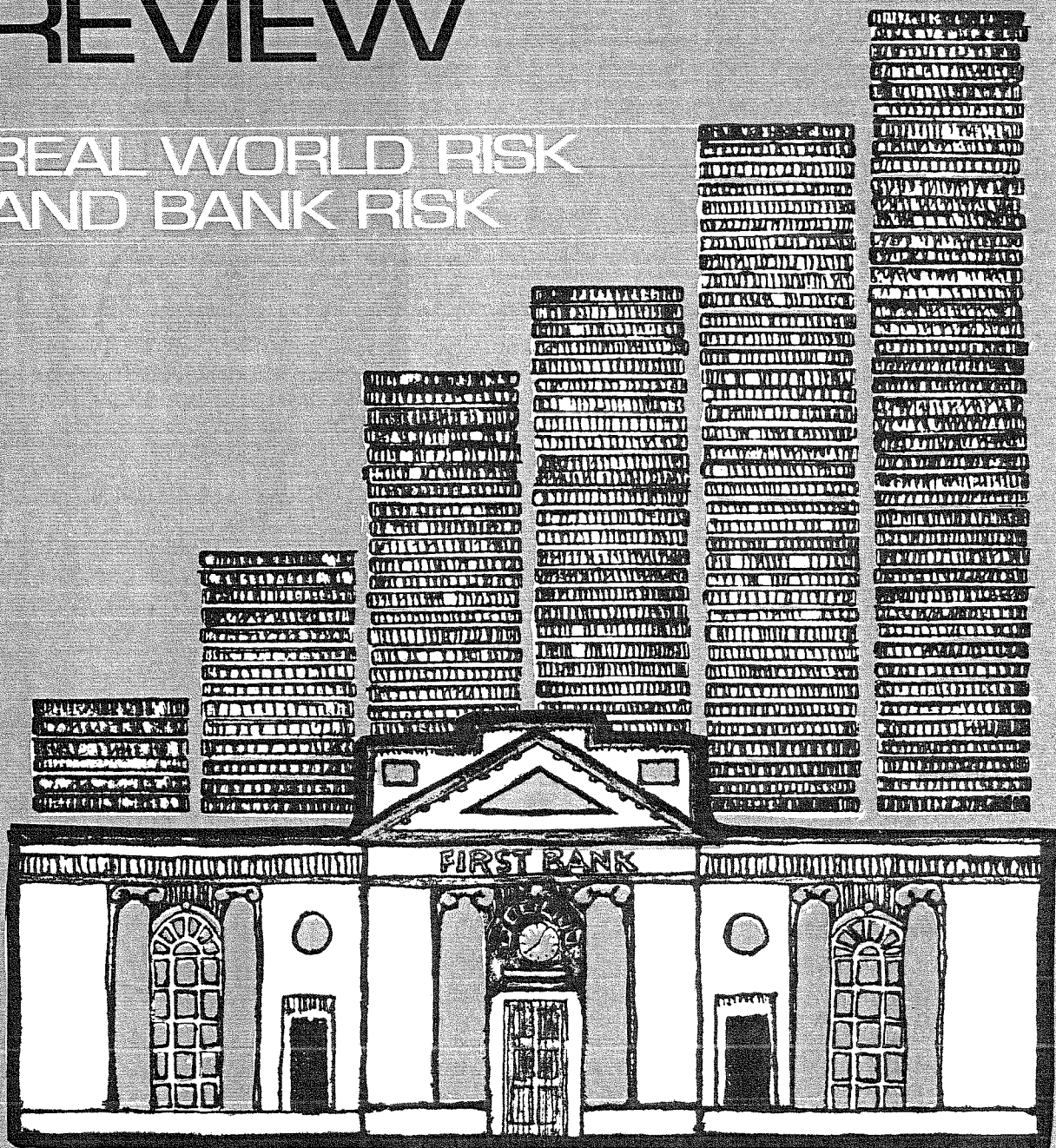


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AND BANK RISK



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Real World Risk And Financial Institutions

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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

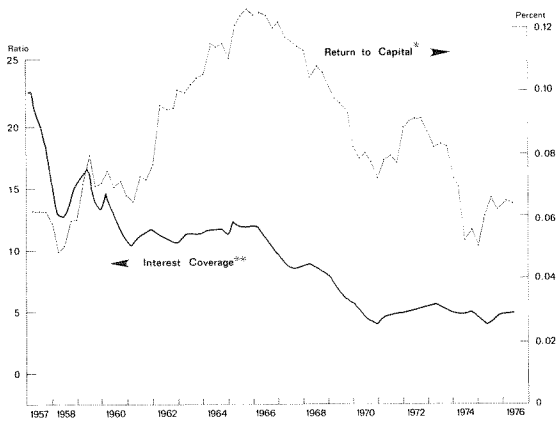
An increase in uncertainty in real markets should not impinge heavily on financial markets when corporations do not depend on them as a steady source of funding. By the 1970s, however, just such a dependence developed, as significant changes occurred in corporate balance sheets. Debt came to be used 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.

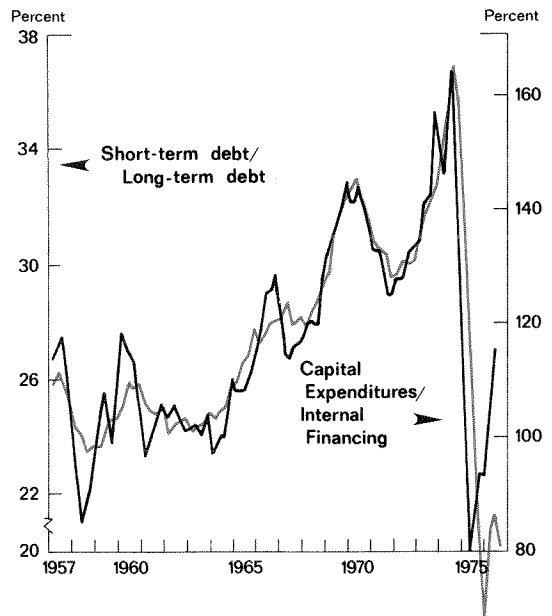
The “times interest” ratio is a worthwhile measure of risk because it measures the corporation’s interest burden in terms of the relative vulnerability or exposure of its balance sheet.⁷ Consider the relationship of the interest cover and the rate of return on capital in each period. The times interest 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

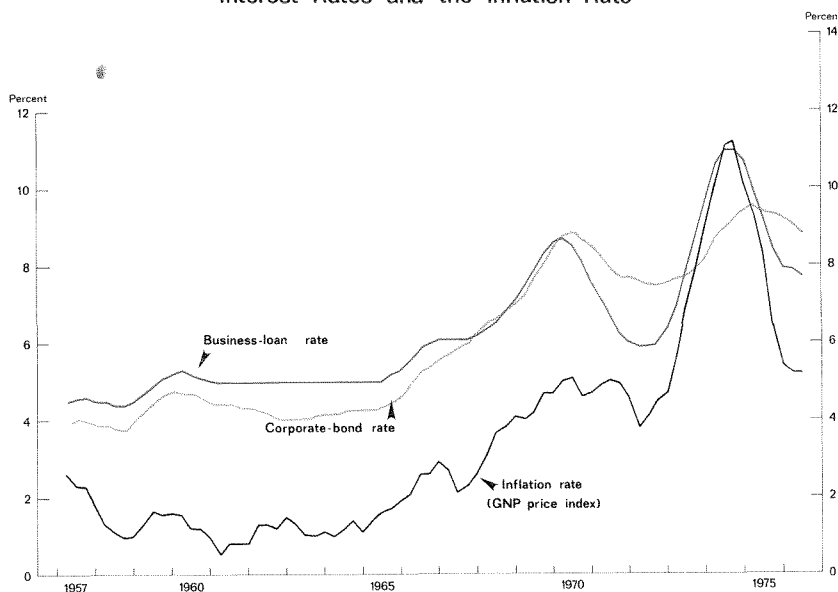
1970s, as interest rates rose to ever-higher levels, corporations elected to borrow at short-term—even at higher rates—rather than commit themselves to long-term debt obligations. This introduced another element of risk, since short-term debt must constantly be rolled over at possibly ever-higher rates. 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.

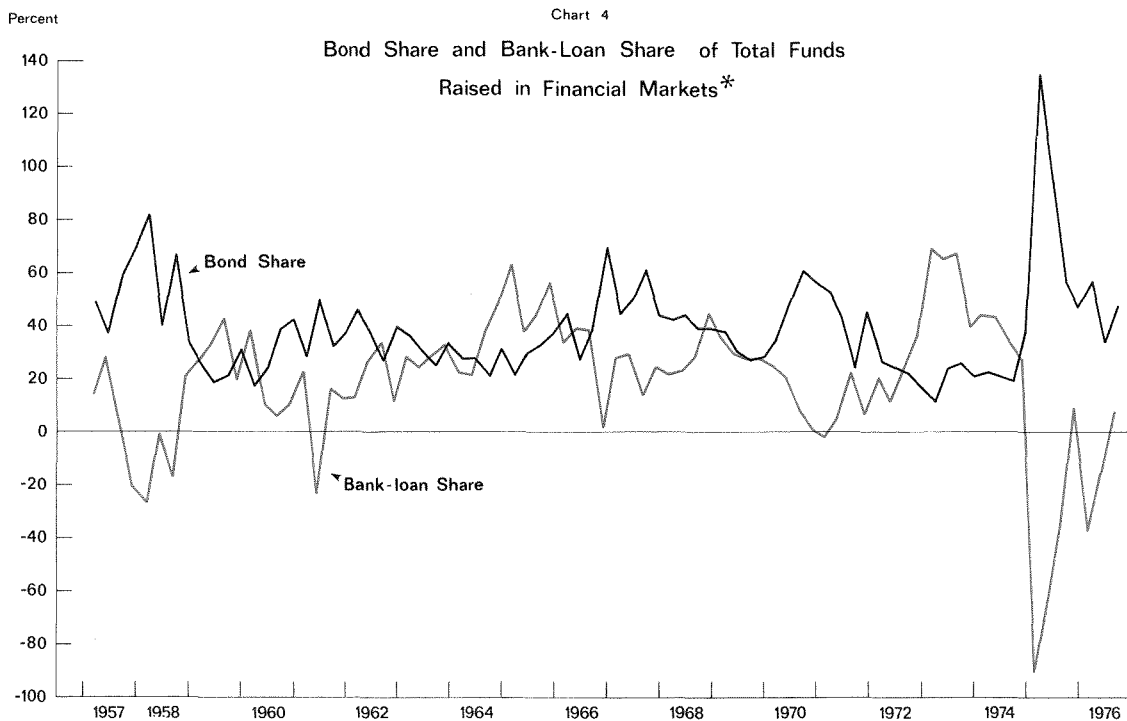
From late 1973 until the beginning of 1975, the sharply rising inflation rate substantially exceeded the long-term rate on new bond issues. In contrast, the short-term rate on business loans followed the inflation rate upward in 1974 and peaked at less than 1 percent below the inflation peak. In those 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.