

The Capital Formation Problem in the United States

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It is well known that the behavior of business fixed investment in the United States during the present expansion has been extremely sluggish. In the fourth quarter of 1977, real investment outlays were two percent below their level during the peak fourth quarter of 1973. At a comparable stage of four previous post-war business "cycles" (excluding the short 1957-1960 "cycle"), real business fixed investment was 14 percent above its level at the previous cyclical peak.¹ When adjusted to exclude noncapacity-creating investment in pollution abatement equipment, the ratio of business fixed investment to GNP in 1977 was only 9.3 percent. During the decade 1965 through 1974, business fixed investment averaged 10.4 percent of GNP. Moreover, the investment that has taken place has been skewed toward equipment and relatively short-term projects and away from structures and relatively long-lived investments. Many observers have interpreted these data as implying an impending "shortage of capital" in the United States. Similar interpretations have been made for the major OECD countries, suggesting that the problem is worldwide in nature.

The term "capital shortage" is always troublesome to an economist since if prices and interest rates are free to adjust, a market system will insure that shortfalls in industrial capacity do not persist. Given adequate lead time and an absence of impediments to the adjustment process, there is no reason to expect a chronic shortage of any type of productive facility. Is there then a reasonable case to be made for a national concern about capital adequacy? In my judgment, the legitimate arguments boil down to a perceived difference between the productive capacity investment we have or are likely to have and what we need in order to meet some national priorities. I would like to begin today by reviewing the thrust of these arguments.

Why Increased Private Investment is Needed

Many of those worrying about inadequate investment have focused on the goal of avoiding capacity bottlenecks and inflationary pressures as the economy

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¹ See *Economic Report of the President*, 1978, 66-68.

approaches full employment of its resources. While manufacturing capacity does not appear to be inadequate now, William Nordhaus estimated in late 1977 that a reduction in unemployment to the "full employment" level (estimated now by the Council of Economic Advisers to be 4.9 percent) would carry capacity utilization to the level of 90 percent.² This is higher than any level of capacity utilization we have ever achieved in peace time and exceeds the 88 percent utilization level that existed in 1973 when capacity bottlenecks were widespread. To put the matter another way, the slow recent growth of industrial capacity in the United States may have created an imbalance between markets for labor and capital. An analysis by the Council of Economic Advisers (1978) suggested that, at the start of 1978, there appeared to be a mismatch between labor capacity currently available and present capital capacity.³

Recent events have tended to cast considerable doubt on this contention. During the first half of 1978, employment growth was remarkably strong, raising questions whether "Okun's Law" had been repealed. The unemployment rate declined from a 7.0 percent average level in 1977 to 5.7 percent in June 1978. (Over the same time period capacity utilization rates hardly increased at all.) The 5.7 percent unemployment rate was close to the range many observers believe now represents "full employment" in view of the present demographic composition of the labor force. Nevertheless, our crude methods of seasonal adjustment and discrepancies between the payroll and household employment surveys raise questions about the reliability of any one-month unemployment rate. Indeed, the rate rose to 6.2 percent during July. Moreover, as we look forward in time, the changing demographic character of the labor force (and a possible diminution in the rate at which women are entering the labor force) should tend to lower the "full employment unemployment rate." In addition, there are serious questions about the proper interpretation of our capacity utilization measures. Thus, probably the safest conclusion at this time is to regard the capacity constraint argument with perhaps some skepticism but certainly as a possibility.

A second argument suggesting a need for more capital formation is that the decade ahead will be an era of special additional requirements for investment to

² William Nordhaus, "Will Bottlenecks Slow the Expansion?" Paper presented to the Federal Reserve Bank of St. Louis Conference on U.S. Productive Capacity, October 7, 1977. The Nordhaus estimates were slightly revised in the Council of Economic Advisers' 1978 report.

³ Dale Jorgenson (1977) takes a different view. He argues that the sharp increase in the relative price of petroleum products will cause a substitution of labor for capital and will enable the economy to get along with a smaller investment share, *ceteris paribus*. Thus, Jorgenson would not be surprised by the extraordinary employment gains registered in early 1978. His argument is that capital and energy have tended to be complements in the past and thus a higher relative price of energy will cause business firms to economize on both energy and capital. Past periods when the relative price of energy was quite stable may not, however, offer reliable estimates of the future complementarity of capital and energy. A sharp increase in the relative price of energy may in fact cause considerable substitutability of capital for energy—e.g., as in increased investment in insulation. Moreover, recent increases in energy prices may have made obsolete a considerable part of our current plant and equipment and may have created very profitable investment opportunities. Finally, it should be noted that the major increases in employment in 1978 have occurred in the service industries, not in the manufacturing sector where, according to Jorgenson, the substitution of labor for capital should have taken place.

meet national priorities. Additional investment is needed to satisfy already legislated requirements for safety and for a cleaner environment. In addition, larger amounts of capital are needed to give us a more secure energy position. Several normative studies have attempted to measure the share of GNP that must be devoted to investment if the nation is to achieve a specified set of goals.⁴ One of the most careful studies, by Beatrice Vaccara (1976), estimated the investment required to meet the goals of a high level of employment by 1980 and the achievement of various environmental and energy targets. Her conclusion, similar to that of other normative studies, is that a temporary increase in the share of GNP devoted to business fixed investment is necessary to achieve the targets. Given the large number of conditions and qualifications that must be attached to any estimate of capital requirements, no such exercise can be conclusive. Moreover, some of the studies used targets that have subsequently become unrealistic such as the goal of much greater energy independence. Nevertheless, the robustness of the findings regarding the need for a somewhat larger temporary investment share, even when some targets are changed across studies, is striking.

The rather dismal behavior of productivity growth over the past decade (even after cyclical adjustments) provides a third reason to worry about the adequacy of business fixed investment. A variety of factors are undoubtedly involved in the slowdown in the growth of productivity and a full explanation is not now available. Nevertheless, studies by Clark (1978) suggest that one important determinant of the productivity slowdown is the low level of investment in recent years. From 1947 to 1968 the amount of capital stock per unit of labor grew at an annual rate of about three percent. During the past decade the growth rate fell to one percent. Rapid productivity growth is desirable because it helps to contain inflation as well as to provide the underpinnings for continued long-run growth in real incomes.

Indeed, the slowdown of productivity growth may well have contributed to the stagflation condition that has characterized many of the Western economies. If labor has become accustomed to, and believes it is deserving of, increases in real wages larger than the *present* growth in productivity, wage bargains will tend to be made that attempt to push up the real wage faster than can be supported by productivity growth. The resulting struggle over income shares can lead to both inflation (since unit labor costs will continue to be pushed up) and unemployment (since the real wage may turn out to be higher than is consistent with full employment). Additional investment would tend to increase productivity, helping to contain inflation, and also to raise the marginal product of labor, contributing eventually to greater employment.

Finally, the international payments position of the U.S. economy provides a further reason why more investment is desirable. Since 1974, the U.S. has run a substantial deficit on current account, financed largely by borrowing from the surplus countries, especially members of OPEC. If this borrowing is used to finance an expansion of domestic investment, the additional income from this investment can provide a source for future service payments on foreign debt

⁴ See, for example, Barry Bosworth, James S. Duesenberry, and Andrew S. Carron (1975), and Benjamin Friedman (1976).

without reducing domestic consumption. Moreover, the investment can make up the shortfall in aggregate demand caused by the net export deficit.

Why is Investment so Weak? Some Popular Explanations

I suspect most observers would accept at least some of the arguments above and would agree that a case can be made for the desirability of a somewhat increased share of investment in GNP over the next years. Nevertheless, disagreements arise over the cause of the problem. Some analysts have suggested the poor behavior of business fixed investment during the present expansion can *fully* be explained by the large amount of unused capacity existing in manufacturing industries. To be sure, capacity utilization is an important factor in explaining the sluggishness of investment. The 1974–1975 recession carried utilization rates far lower than in other previous cycles and the upturn in investment has clearly been associated with increases in capacity utilization rates. Nevertheless, business investment is somewhat lower than would be expected on the basis of utilization rates alone.

Residuals from an equation developed by George von Furstenberg, which relates the gross investment rate, I_t/K_t , (investment as a proportion of the capital stock) to capacity utilization (as well as to tax and capital stock-mix variables), show a fairly consistent over-prediction of investment during the recent expansion.⁵ Investment appears to be weaker than would be expected from the recent low levels of capacity utilization. Similar findings have been observed in the investment equations of some econometric models that rely heavily on utilization rates in predicting investment. The Council of Economic Advisers (1978, p. 71) reached a similar conclusion: "It appears, however, that total investment outlays during the expansion have fallen somewhat short of those implied by historical relationships of investment to its determinants." Their work suggests this is true because of the weakness of investment in long-lived structures. Thus, low capacity utilization cannot *fully* explain the recent behavior of business fixed investment.

Other analysts have suggested that lagging investment can more satisfactorily be explained by falling profit rates. Arthur Burns (1977) has recently argued that a precipitous drop in profitability—induced in part by inflation—is the major consideration in explaining our poor recent investment behavior. A similar view had been presented by John Tatom and James Turley (1978). It is well known that, *ceteris paribus*, inflation does tend to increase effective tax rates on true economic income. This is so because tax deductible depreciation charges are based on historical rather than replacement cost and because realized inventory profits are subject to corporate taxes. Nevertheless, there is another important accounting adjustment that must be made before the true effect of inflation on corporate profitability can be determined. Inflation—either anticipated or unanticipated—also reduces the real value of corporate indebtedness and this gain to the corporation and its shareholders must be considered in any assessment of economic profit levels.

⁵ See George von Furstenberg (1977). I am grateful to him for running his equations for me through more recent periods than were done in his original paper. In general, the von Furstenberg capacity-utilization equations fit very well over the period since 1952.

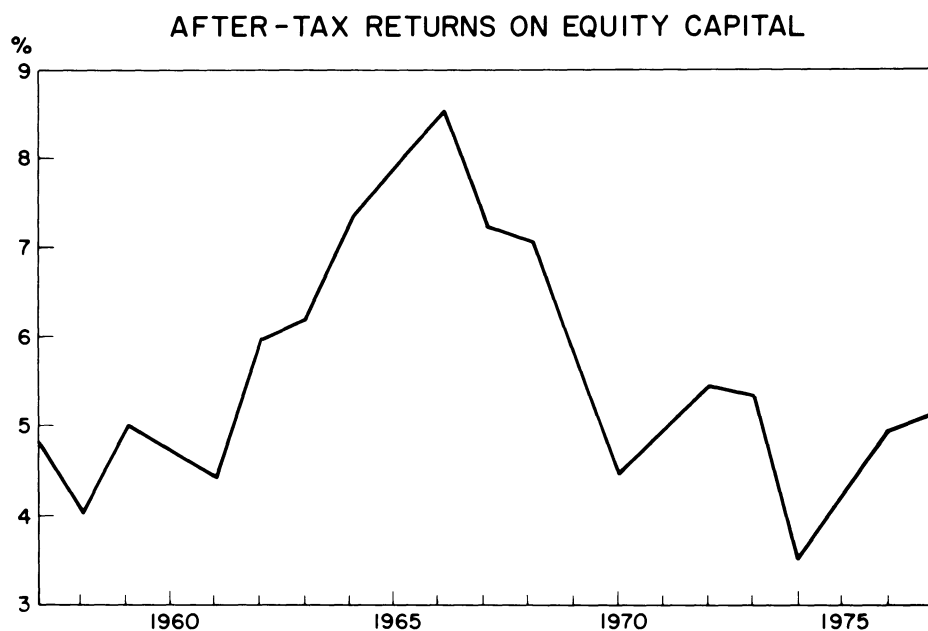


Figure 1

Our current accounting conventions ignore the effect of inflation in causing the real value of all fixed-income liabilities to fall. The counterpart of the bondholder's loss from inflation is the bond issuer's gain. Of course, once the inflation is expected, bondholders demand an inflation premium in interest rates to compensate for this real indebtedness effect. Our accounting conventions do penalize earnings for the inflation premiums contained in interest rates since all interest is deducted before calculating corporate profits. But the corresponding gain to the corporation that comes from the reduction in the real value of the indebtedness is never considered. And this gain to the corporation and its shareholders from the declining real value of corporate debt must be included in any valid measure of inflation-adjusted profits.

Using a technique I have developed with George von Furstenberg (1977a), Figure 1 shows the progression of profit rates from 1957 to the present.⁶ These data relate yearly corporate income after interest and taxes (excluding inventory profits and using replacement cost depreciation) plus the yearly reduction in real indebtedness to the replacement value of corporate assets for the nonfinancial corporate sector. The figure shows that there is no evidence that corporate profitability is in a long-run decline. While profits are certainly lower than they were in earlier periods in the mid-1960s, they are not much different in the late 1960s and early 1970s from what they were in the late 1950s and early 1960s. Interestingly enough, both these periods were ones of substantial excess capacity. What appears to be more of an aberration is the period from the mid-to-late 1960s

⁶ The technique estimates the reduction in real indebtedness using as a "normalized" inflation rate the increase in unit labor costs for the year adjusted for cyclical effects on productivity.

when profit rates were unusually high and when the economy was characterized by "overfull" employment and flat-out capacity operations.

When the reduction in real indebtedness is considered, there is also no evidence of a persistent inflation-induced increase in effective corporate tax rates. While there is a tendency for inflation to increase effective tax rates through the underreporting of depreciation and the taxation of inventory profits, reductions in corporate tax rates and liberalization of depreciation rules put into effect over the period as well as the nontaxed gains from reduced real indebtedness have tended to lower the tax rates on true economic income. On balance, there is no evidence of a persistent tendency toward increased taxation of real business profits, at least on the corporate level.⁷

Finally, it should be noted that these data on rates of return have not been cyclically adjusted. As Feldstein and Summers (1977) have shown, when one accounts for the fact that low levels of capacity utilization are associated with high overhead costs per unit of output and thus a tendency for low profits, the picture looks even brighter. On a cyclically adjusted basis, profit rates in recent years actually appear to be somewhat above their levels during the decade of the 1960s.⁸

Of course these data must be interpreted with some care. They measure average profit rates on past investments, not the anticipated future rates of profits that are relevant for optimal decision making. It is quite possible that expected returns on new investment could rise just as past profit rates have fallen. For example, past profit rates may have tended to fall because relative price changes have made obsolete many facilities constructed on the basis of a different price structure. But such obsolescence may lower average returns on past investment while at the same time increasing anticipated returns on future investment. Alternatively, expectations of future profit rates may have fallen as businessmen fear that a reimposition of price controls could restrain the normal future cyclical expansion of profit rates. Thus, this analysis of past profit rates cannot settle the issue regarding the adequacy of profit incentives. Nevertheless, if profit rates had in fact deteriorated on past investment, financing problems would be created for business firms as well as unfavorable expectations for the future. Thus, it is comforting to know that properly adjusted profit rates reveal a picture that is far more favorable than has been commonly supposed. While investment may well be hindered by poor expectations of *future* profitability, there is no evidence that profits have been damaged thus far in the United States.

Risk Premiums and Corporate Investment Decisions

If the sluggishness of investment cannot fully be explained either by low capacity utilization or by inadequate current profitability and cash flow, are other

⁷ George von Furstenberg (1976) has actually estimated effective tax rates for the period and finds that the effective corporation income tax rate on true economic income has not risen. On the other hand, the hidden "taxes" imposed in the form of OSHA and EPA requirements have clearly grown.

⁸ I cyclically adjusted these data using the Council of Advisers "GNP gap" series and found that cyclically adjusted (as well as inflation adjusted) profits in 1976 were actually above the average cyclically adjusted profit rates in the 1957-1969 period. It should also be noted that a similar analysis of profits available for common shareholders plus interest payments to bondholders shows a similar pattern when cyclically adjusted.

promising explanations available? I believe a strong case can be made that a number of economic developments of the early 1970s have undoubtedly raised substantially the risk premium attached to investment decisions. Such increased risk premiums have increased the hurdle rates associated with new corporate investment projects (or alternatively they have increased the discount rates used to evaluate net present values). As a result, many investment projects that otherwise would have been undertaken have been cut off by the increased risk premiums.⁹

Simply put, the U.S. economy became very much less stable in the early 1970s. A decade ago, we believed that deep recessions were a curious anachronism and that even mild recessions could be fine-tuned away. Few would have believed that the United States could experience double digit inflation or that the unemployment rate could climb to nine percent. Fewer still would have believed that these events could happen simultaneously. While the economy has recovered from the sharp 1974–1975 recession, inflation has remained at a high rate despite considerable slack in the economy and the inflation rate has been accelerating as we approach fuller capacity utilization. Inflation is far from neutral as it appears in many textbooks. High levels of inflation are associated with considerable variability in the inflation rate and with large relative price changes, which make long-run future planning especially hazardous.¹⁰ Thus, even if total profits increase *pari passu* with inflation, the dispersion of profits among businesses increases with the rate of inflation. Moreover, businessmen fear that a continuation or acceleration of inflation may lead to price controls that would impinge on corporate profitability.

Nor is the recent period of stagflation the only cause for greater uncertainty. Uncertainty has also increased because of escalating business regulation. Changing environmental regulations have considerably added to the cost, increased the delays, and added to the risks of many major corporate investment projects. Similar concerns involve changing health and safety regulations and uncertainties regarding future energy policies. It is not so much the direct cost of regulation that has inhibited investment but rather the unpredictability of future regulatory changes.

Finally, the weak capital structures of many firms may have tended to increase risk premiums in financial markets. Capital structure theory¹¹ suggests that in a world without corporate income taxes it should make no difference to the firm whether it issues debt or equity. In a world with corporate income taxes, however, debt financing is “cheaper” than equity financing and firms will be encouraged to push up their debt-equity ratios. Merton Miller (1977) in his presidential address to the American Finance Association indicated even with taxes it is possible that debt financing would not be encouraged and may be a matter of indifference for the individual firm. Miller’s result required that the following equality must be satisfied:

$$(1 - \tau_{PB}) = (1 - \tau_C)(1 - \tau_{PS}), \quad (1)$$

⁹ A similar explanation has recently been offered by Alan Greenspan (1977).

¹⁰ See Vining and Elwertowski (1977) and Parks (1978).

¹¹ See Modigliani and Miller (1958), (1963), referred to as M/M.

where τ_{PB} , τ_C , and τ_{PS} are the personal tax rate on bond income, the corporate tax rate and the personal tax rate on stock income, respectively. If the right-hand side of (1) is less than the left-hand side, then the value of the firm will always be increased by more leverage.

Suppose, however, that the personal tax rate on returns from stock ownership τ_{PS} , is zero—because individuals either offset taxable returns from stocks with interest paid on borrowings or because stocks are held in essentially tax-free retirement accounts. Then if the marginal personal tax rate on bond interest, τ_{PB} , is 48 percent, the same as the marginal rate on corporate income, τ_C , it will make no difference if the firm finances itself with debt on equity. While debt returns come before corporate taxes, they are taxed to the bondholders at the corporate rate. Payments to equity holders come after payment of corporate taxes but, by assumption, are tax free to the equity holder. Optimal financing policy becomes a matter of indifference.

Unfortunately, the necessary constellation of tax parameters does not appear to be met in practice. Even if $\tau_{PS} = 0$, which would give Miller his best argument, empirical estimates of the marginal tax rate on taxable debt tend to be considerably lower than τ_C .¹² Thus, it is difficult to escape the conclusion that business firms ought to be driven to the corner solution of all new debt issue even in an M/M world.

A compromise position is that an optimal capital structure does exist but not for the traditional reasons popularized before the M/M contribution. Debt ratios are not pushed to the limit because the increased possibility of bankruptcy can damage the entire stream of operating earnings of the firm. This is so not simply because of the cost of bankruptcy, per se, but also because of the inability of the management of near bankrupt firms to negotiate effectively with suppliers, to insure customers of prompt deliveries and service, and to spend its time on business rather than financial problems.

Similar kinds of monitoring costs for lenders put a limit on the degree to which they will allow a firm to lever itself.¹³ Still, the tax savings on bond interest have led to increased reliance on debt financing and by the early 1970s debt ratios had increased substantially from their levels of the 1950s. Now if the underlying instability of the economy increased in the mid-1970s, as I have suggested above that it did, so will the perceived riskiness of companies with high debt. Consequently, many firms will find their debt ratios higher than optimal for the more unstable economic environment. The high risk premiums in financial markets during the 1970s may well have been affected by capital structures that were too levered for the less stable present environment. Moreover, despite the strengthening of capital structures effected since 1974, this may well still be the case today, especially when account is taken of uncanceled lease obligations and unfunded pension fund liabilities.

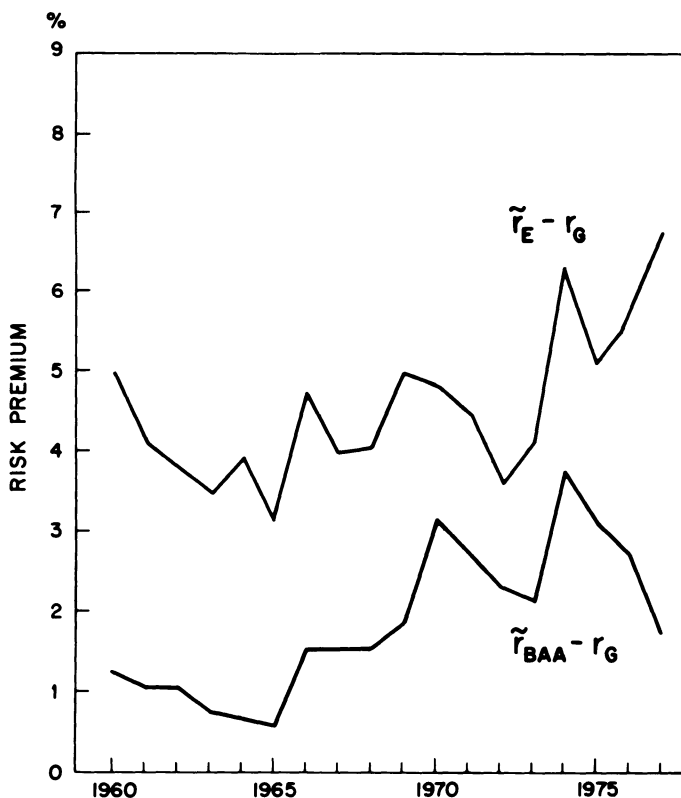
¹² See, for example, the estimates of J. Huston McCulloch (1975), on the marginal tax rate of the holders of government debt. An extension of Miller's arguments about the taxation of stock returns as well as estimates of the marginal tax bracket of holders of tax-exempt securities also suggest a relatively low marginal tax rate on bond interest.

¹³ Moreover, in practice, there are likely to be very high costs and significant impediments to having a financial intermediary "rescue" the company by purchasing all of its securities and reconstituting them, as suggested by Stiglitz (1974).

Evidence of Increased Risk Premiums in Financial Markets

I have suggested that an important explanation of the sluggishness of business fixed investment in the United States is that risk premiums have increased in financial markets during recent years. This has raised the cost of capital for firms and increased the hurdle rate investment projects must surpass if they are to be undertaken. While the argument may seem reasonable enough, what evidence can be adduced to support this hypothesis and how do we know that these effects have had a substantial effect on investment? These are the questions I will address next.

It is difficult to measure the precise extent to which risk premiums have increased in financial markets during recent years. Two indirect methods of estimating risk premiums may usefully be employed, however. The first method calculates the spread between the yields of medium quality (BAA) corporate bonds, $\tilde{r}_{BAA}$, and the yields of long-term (10-year) government bonds, r_G . As Figure 2 shows, this spread fell through the mid-1960s and then rose sharply, reaching a peak in 1974. While the spread has receded since 1974, it is still considerably higher than its average in the 1960s. While such a yield spread calculation may not be a pure measure of risk premiums, it is surely suggestive of

ESTIMATED RISK PREMIUMS IN FINANCIAL MARKETS**Figure 2**

a movement toward much higher risk premiums during the decade of the 1970s.

As a second method for estimating risk premiums in financial markets, I have used anticipated equity returns rather than bond market returns. It is possible to measure risk premiums in equity markets by calculating the differences between the anticipated rate of return on stocks, $\tilde{r}_E$, and the rate of return on riskless long-term Treasury securities.

According to the well known "infinite horizon" stock valuation model, the anticipated rate of return on equities can be estimated as the sum of the anticipated dividend yield for the next year, $D_0(1 + g)/P_0$, and the estimated long-run growth rate (g) of earnings and dividends as is shown below. On the basis of Equation (2), it is possible to estimate the anticipated rate of return on equities for the market (i.e., the Dow Jones Industrial Average) for the period from the early 1960s to the present.

$$\tilde{r}_E = \frac{D_0(1 + \tilde{g})}{P_0} + \tilde{g} \quad (2)$$

Estimated growth rates (of earnings per share) for each of the stocks can be obtained from the Value Line Investment Survey. The risk premiums on common stocks can then be estimated as the spread between the anticipated (long-run) rate of return on equities and the long-term Treasury rate (r_G).

It may be argued, however, that the infinite horizon assumption is not appropriate for the evaluation of equities as I have suggested myself (1963). Moreover, the Value Line long-run growth estimates used in the calculation were explicitly made for only five years. We can assume, however, that the five-year growth rate decays exponentially to the long-term growth rate for the economy, g_p (currently 3.6 percent), over a period of years and recalculate the anticipated rate of return on equities and the yield spread. I have chosen this second method and have calculated the expected rate of return on equities ($\tilde{r}_E$) on the basis of Equation (3) below.

$$P = \frac{D_0(1 + g_t)}{(1 + \tilde{r}_E)} + \dots + \frac{D_0(1 + g_t)^5}{(1 + \tilde{r}_E)^5} + \frac{D_0(1 + g_t)^5(1 + g_{t+1})}{(1 + \tilde{r}_E)^6} + \dots \\ + \frac{D_0(1 + g_t)^5(1 + g_{t+1}) \dots (1 + g_{t+15})}{(1 + \tilde{r}_E)^{20}} + \sum_{i=1}^{\infty} \frac{D_{20}(1 + g_p)^i}{(1 + \tilde{r}_E)^{20+i}} \quad (3)$$

where $g_{t+1} = g_t - \alpha(g_t - g_p)$, and $D_{20} = D_0[(1 + g_t)^5(1 + g_{t+1}) \dots (1 + g_{t+15})]$. The dashed line on the top of Figure 2 shows the estimated risk premiums on stocks ($\tilde{r}_E - r_G$) calculated from Equation (3). α was assumed to be 0.25. I have performed a number of these calculations, using alternative α 's, different horizon periods before the growth rate falls to its "permanent" level, and alternative valuation models including my own (1963) and the infinite horizon model of Equation (2). The results are remarkably robust and the estimated risk premiums are all very similar to those displayed on the chart.¹⁴

¹⁴ The terminal growth rate of 3.6 percent may legitimately be criticized as being too conservative since it is an estimated *real* growth rate for the economy's potential rather than a *nominal* growth rate at which corporate earnings might be expected to grow. Nevertheless, the effect of a conservative growth rate in the twentieth year has only a minor effect on the calculated internal rate of return. The numbers plotted in Figure 2 are little different from those that would be obtained from an infinite extrapolation of present growth. I am indebted to Patric Hendershott for helpful discussions on this point.

It will be noted that movements in the estimated equity-market risk premiums follow the bond market risk premiums remarkably closely. Estimated risk premiums fell until the mid 1960s and then rose into the early 1970s. Unlike the risk premiums measured in the bond market, however, it appears that the risk premium derived from the equity market did not peak in 1974 but has risen again in 1976 and 1977.

A convenient summary statistic, which combines many of the market valuation factors I have just been discussing, is James Tobin's "*q*" ratio.¹⁵

$$q = \frac{N_S P_S + N_B P_B}{K P_K} \quad (4)$$

where the *N*'s are the number of equity shares and bonds and the *P*'s are prices of shares, bonds and the capital stock (*K*), including inventories and land. Tobin argues that the inducement for private investment may be effectively estimated on the basis of this relationship between the market value of a company and the replacement value of its assets. If, for example, assets are valued in the market at, say, one and one-quarter times their replacement cost, corporations will be encouraged to invest in new equipment and thereby create capital gains for the owners of its securities. On the other hand, if assets sell for less than their replacement value, corporations who sell new securities to buy new capital goods will be creating capital losses for their security holders. In the latter case, we can infer that the real cost of capital has risen relative to the average profitability of past investment projects. Figure 3 shows the behavior of the average "*q*" over the past decades as well as the close relationship between "*q*" and the share of business fixed investment in GNP.¹⁶

It will be noted that in the mid-1960s the "*q*" ratio was approximately one and one-quarter, that is, investments were being valued in the market at one and one-quarter times their replacement cost. As might be expected the inducement to invest was great and so was the share of business fixed investment of GNP. At the end of 1977, however, the ratio of corporate market values to asset replacement values had fallen to about three-quarters; that is, corporate investments were on average being valued in the market place at less than three-quarters of the cost of replacement. "Why invest in real capital assets?" the corporate treasurer may say, when he can buy claims on these assets in the market place at 75 cents on the dollar. When this ratio of market value to replacement cost is added to the standard investment equations, they then predict very well the poor investment performance we have been experiencing. For example, I noted above that investment equations based on capacity utilization rates had tended to overpredict investment during the recent upswing—particularly for structures. When "*q*" is added to the equations, however, the overprediction disappears. The financial markets reflect the large risk premiums currently existing and the recent behavior of "*q*" is quite consistent with the hypotheses I have been advancing today.

¹⁵ For a discussion of "*q*", see William C. Brainard and James Tobin. Alan Greenspan (1959) appears to have been the first to use the market value of firms as a determinant of the rate of investment. A detailed account of the problems involved in constructing and interpreting "*q*" ratios can be found in von Furstenberg (1977).

¹⁶ "*q*" in the period *t* - 1 is plotted to account for the lag between investment decisions and actual spending.

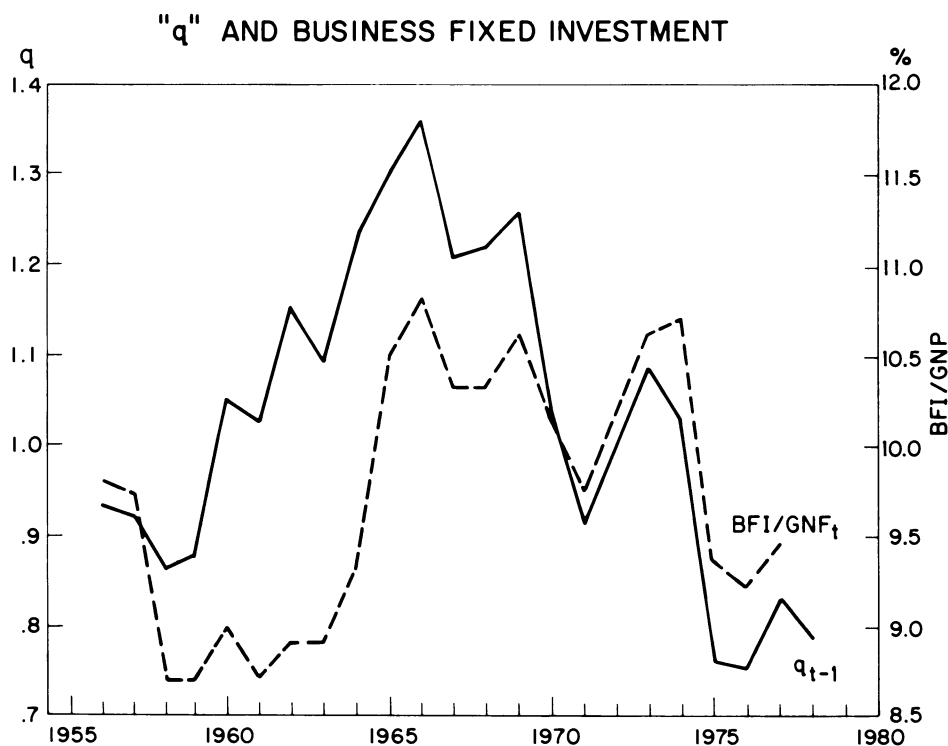


Figure 3

" q " estimates are of course beset by a number of conceptual and measurement problems. For example, there is the obvious aggregation problem. " q " could be well above unity for several industries doing a great deal of investment yet the average " q " could be below unity because other industries have extremely low " q 's."¹⁷ Moreover, the measurement of the capital stock at replacement cost presents serious conceptual problems in the presence of technological progress and changes in relative prices. Finally, it is the marginal " q " on new investments, not the average " q " on old investments that is relevant for corporate decision making. Nevertheless, " q " appears to be a good proxy for the increased risk premiums that appear to be deterring corporate investment.

I should also note that the risk premium explanation is consistent with the structure of investment in recent periods; that is, the tendency for short-term projects to be favored over long-term investment. As every beginning finance student knows, the addition of a risk premium to the discount rate, which is often done in practice, will tend to have a far greater effect in reducing the present value of returns expected many years in the future than it does in reducing nearer-term payoffs.

A small final piece of evidence is that a recent McGraw-Hill survey indicated that about one-quarter of manufacturing companies required that capital expend-

¹⁷ von Furstenberg, Watson and I (1978) find that when " q " is disaggregated by industry, it has a strong effect on industry investment.

itures for modernization and replacement meet a three-year pay-back criterion.¹⁸ In a similar survey taken in 1969, only 20 percent of the firms surveyed required a three-year pay-back. The pay-back criterion is, of course, a very crude method used by businessmen to account for risk and is again suggestive of the influence of increased risk factors on corporate investment decisions.

Policies for Increased Capital Formation

I have suggested that the current environment is one in which business fixed investment is likely to be inadequate to meet a number of economic goals such as high employment, avoidance of capacity bottlenecks, growth of productivity, and the achievement of environmental and energy targets. Investment is being hindered by a variety of factors including the excess capacity still remaining and what appears to be a sharp increase in risk perceptions in the economy, generated in part by recent price and income instability. This is not to say there is an impending "shortage of capital" in the United States. Like most economists I agree that the workings of a market-oriented system will lead to automatic adjustments in discard rates, factor-utilization intensities, and the level and composition of final output to insure that, *ex post*, no shortage of capital will in fact exist.

Given adequate lead time and barring impediments to the adjustment process, there will not be a shortage of capital in the same sense in which there can be said to have existed at times a shortage of natural gas. Nevertheless, the kind of normative estimates of capital needs I reviewed earlier can still be very useful guides for policy. Input substitutions are not always accomplished quickly and with facility, nor are factor prices always perfectly flexible. It is therefore possible that "full" employment cannot be achieved by 1980 if we do not meet the estimated capital requirements. Alternatively, environmental, energy independence, and productivity goals may not be met. The point is that any of these adjustment mechanisms, including a decline in the relative price of labor, may be less desirable than providing incentives or altering the mix of monetary and fiscal policies to raise temporarily the share of investment in GNP. After all, facilitating economic adjustments is a normal part of the stabilization activity of government and does not necessarily imply any *permanent* shift in the composition of output between consumption and investment. Moreover, as was shown in von Furstenberg and Malkiel (1977b), the government itself has taken a number of actions in recent years that have worked against capital formation, even in a full-employment context. Thus, it seems appropriate to conclude this paper with a brief discussion of a number of policies that deserve consideration for the capital formation problems I have outlined.

1. It is doubtful that substantial increases in investment will be undertaken if the economy falls into a new recession. It seems desirable therefore that macro-economic policies continue to guide the economy cautiously toward maintaining positive real growth and toward a fuller utilization of its labor and capital resources. At the present time investment and consumption still appear to be complementary rather than competitive. Indeed, as Nordhaus (1977) has recently

¹⁸ This evidence was reported in Greenspan (1977).

pointed out, higher capacity utilization rates may be necessary now to encourage an adequate growth in capacity for the future.

2. But while accommodative economic policies are necessary to stimulate corporate investment, a very cautious and sustainable expansion will provide a far better climate for corporate investment than a return to stop-go economic policies. A path of overly rapid growth now could easily generate significant demand-pull inflation, which would inevitably be followed by another round of deflationary policies. This is a scenario that must be avoided. Moreover, the government must stop the series of actions, such as import quotas, acreage restrictions, etc., it has taken recently, which have, in effect, legislated increases in the inflation rate. Rapid inflation often engenders "income policies" that squeeze profit margins, and creates severe balance sheet strains. Moreover, variability of economic policies and accelerating inflation tends to increase risk premiums in security markets and thereby discourages investment. Stability and dependability in government policies for environmental improvement, health and safety, and energy would also be most welcome. If stability in environmental policies is impossible, some kind of insurance scheme to compensate firms for unanticipated changes in environmental policies would appear deserving of consideration.

3. If investment expenditures are to rise as a percentage of GNP, as seems desirable, savings will also have to increase. One of the surest ways of obtaining additional savings is to have the government do the saving by running surpluses in the Federal budget at high levels of employment.

Unfortunately, aggregate economic policies followed during this expansion have not been consistent with this hope. During the recovery from the 1974-1975 recession, we have relied primarily on fiscal policy to stimulate the economy. Despite three years of recovery, the national income account budget deficit has remained large and substantial full-employment deficits exist.

A policy mix that relies less on consumption-oriented fiscal expansion and more on monetary stimulus would be more conducive to high rates of private investment. During the coming years, a slower rate of increase in Federal outlays and a reduction in the budget deficit would permit a more expansionary monetary policy to be carried out with less risk of inflationary pressures. Such a policy mix would tend to shift the composition of output toward investment.

4. Corporate tax relief may also be usefully employed to offset the increased risk premiums that appear to have hindered business fixed investment during recent years. Thus, it would be highly desirable that any tax relief to sustain the level of economic activity include a substantial fraction for corporate tax reduction through rate cuts, liberalization of depreciation allowances to account for the inflation of replacement costs and through improvement of the investment tax credit. While policy makers must be careful to minimize distortions (e.g., it would be useful to redesign the investment tax credit so as to remove the present bias against long-term investment projects), these suggested measures will tend to raise the prospective return on investment and thereby encourage capital formation.¹⁹

¹⁹ George von Furstenberg (1977) found that a \$2 billion permanent reduction in corporate income taxes would tend to raise q by 4 percent (of its sample mean) during the first quarter for which the cut is in effect.

5. Finally, I have indicated that current corporate tax laws encourage the issuance of debt. But excessive reliance on debt does make owning common stock increasingly risky, and eventually can lead to a substantial risk of bankruptcy for the individual firm. I suggest that our present debt structure is related to the high risk perception of investors and with the low valuations on equities today, as well as with the long-run problems many firms have in raising capital.

In my judgment, we will need to give considerable attention to our debt structure and to government policies that have encouraged us to favor one financing instrument over another. Even if we keep total corporate taxes the same, it might be highly desirable to have a tax system that was neutral with respect to the type of security the firm issued. For example, some portion of the payments to both debt and equity holders could be made free of corporate income taxes, rather than having debt payments come before and equity payments after tax. Alternatively, all interest deductions could be disallowed and the proceeds applied to reducing the corporate income tax. Such a tax structure could not be introduced immediately because it would unfairly alter the relative tax liabilities of corporations with high and low indebtedness. Nevertheless, it might be applied to new debt or equity issues so that the system could be phased in gradually. Stronger capital structures would relieve an important impediment to long-run capital formation.

REFERENCES

- Bosworth, Barry, James S. Duesenberry and Andrew S. Carron, *Capital Needs in the Seventies*. Washington: Brookings Institution, 1975.
- Brainard, William, and James Tobin, "Pitfalls In Financial Model Building," *American Economic Review*, Vol. 58, No. 2, May 1968.
- Burns, Arthur F., "The Need for Better Profits," address given at Gonzaga University, Spokane, Washington, October 26, 1977.
- Clark, Peter K., "Capital Formation and the Recent Productivity Slowdown," *Journal of Finance*, Vol. 33, No. 3, June 1978, pp. 965-975.
- Economic Report of the President and the Annual Report of the Council of Economic Advisers*. Washington: Government Printing Office, 1978.
- Feldstein, Martin and Lawrence Summers, "Is the Rate of Profit Falling?" Washington: *Brookings Papers on Economic Activity*, 1, 1977, pp. 211-228.
- Friedman, Benjamin M., "Public Pension Funding and U.S. Capital Formation: A Medium-Run View," paper presented for the Federal Reserve Bank of Boston Conference, Funding Pensions: Issues and Implications for Financial Markets, Bald Peak, New Hampshire, October 1976.
- Greenspan, Alan, "Investment Risk: The New Dimension of Policy," *The Economist*, August 6, 1977, pp. 31-35.
- , "Stock Prices and Capital Evaluation," *Proceedings of the American Statistical Association*, 1959, 2-26.
- Jorgenson, Dale, "Energy and the Outlook for U.S. Economic Growth," unpublished, 1977.
- Malkiel, Burton G., "Equity Yields, Growth and the Structure of Share Prices," *American Economic Review*, Vol. 53, No. 5, December 1963, pp. 1004-1031.
- , "Reports of the Death of Common Stocks are Greatly Exaggerated," *Fortune Magazine*, November 1977, pp. 157-161.
- , George M. von Furstenberg and Harry S. Watson, "Expectations, Tobin's q , and Industry Investment," *Journal of Finance*, Vol. 34, No. 2, May 1979.
- McCulloch, J. Huston, "The Tax Adjusted Yield Curve," *Journal of Finance*, Vol. 30, No. 3, June 1975, pp. 811-830.
- Miller, Merton H., "Debt and Taxes," *Journal of Finance*, Vol. 32, No. 2, May 1977, pp. 261-275.
- Modigliani, Franco and Merton H. Miller, "Corporate Income Taxes and the Cost of Capital: A Correction," *American Economic Review*, Vol. 53, No. 3, June 1963, pp. 433-443.

- Parks, Richard, "Inflation and Relative Price Variability," *Journal of Political Economy*, Vol. 68, No. 1, February 1978, pp. 79-95.
- Stiglitz, Joseph, "On the Irrelevance of Corporate Financial Policy," *American Economic Review*, Vol. 64, No. 6, December 1974, pp. 851-866.
- Tatom, John A. and James E. Turley, "Inflation and Taxes: Disincentives for Capital Formation," *Federal Reserve Bank of St. Louis*, Vol. 60, No. 1, January 1978, pp. 2-8.
- Vaccara, Beatrice N., "Some Reflections on Capital Requirements for 1980," *American Economic Review*, Vol. 67, No. 1, February 1977, pp. 122-127.
- von Furstenberg, George M., "Corporate Investment: Does Market Valuation Matter in the Aggregate?" Washington: *Brookings Papers on Economic Activity*, 2, 1977, pp. 347-408.
- , "Corporate Taxes and Financing Under Continuing Inflation," in William Fellner (editor), *Contemporary Economic Problems*. Washington: American Enterprise Institute, 1976, pp. 225-254.
- and Burton G. Malkiel, "Financial Analysis in an Inflationary Environment," *Journal of Finance*, Vol. 32, No. 2, May 1977a, pp. 575-588.
- , "The Government and Capital Formation: A Survey of Recent Issues," *Journal of Economic Literature*, Vol. 15, No. 3, September 1977b, pp. 835-878.
- Vining, Daniel R. and Thomas C. Elwertowski, "The Relationship Between Relative Prices and the General Price Level," *American Economic Review*, Vol. 66, No. 4, September 1976, pp. 699-708.