On our cover: These portraits depict four men who managed the nation's financial affairs during the American Revolution:


Haym Salomon (1740-1785), lower left. Financier who placed his private fortune at the disposal of the Continental Congress. Anonymous portrait, ca. 1900, authenticated by the Haym Salomon Foundation. courtesy of the Ford Times, Ford Motor Company.

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The epitome of a capitalistic state and we can't even meet our capital requirements. That's what many are saying. As a result of this concern, a rash of studies forecasting U.S. capital "needs" over the next five to ten years has caught the eye of the financial press as well as high-level policymakers. While most studies conclude our capital "needs" can be met, they suggest it's going to be a tight squeeze. Expanding demands for factories and machines could outstrip the supply of investable funds. Some fear that such a result would curb our rising standard of living. Consequently, Uncle Sam is being urged to reduce his own borrowing and to enact policies encouraging private citizens to save more.

In judging the merits of these policy recommendations, some perspective on the capital needs projections is essential. For example, how reliable are the forecasts of capital demands and supplies likely to be? An even deeper question is whether encouraging capital growth will really increase society's well-being. Indeed, a closer look at both issues suggests that the need for government support of capital accumulation is less obvious than many have indicated.

**PROJECTING CAPITAL NEEDS AND SUPPLIES**

In most studies, future capital needs are simply what the forecasters predict will be the investment plans of households, businesses and government over the next five to ten years. Generally, the predictions have been...
that "special considerations" will enlarge our
future investment demands (as a share of
GNP) relative to actual investment in the past.
If the supply of savings doesn't measure up to
these growing demands, interest rates will be
bid up as borrowers scramble for available
funds. Investors will then be forced to scale
back their spending intentions and actual
investment will fall short of initial plans. The
consequent capital "scarcity" will slow eco-
nomic growth, making it difficult to maintain
our current standard of living.

Expanding Investment Demands. On bal-
ance, capital-needs forecasters expect that
business firms and households will plan to
spend a growing share of GNP as investment
over the next five to ten years.² For businesses,
several considerations are expected to add
the extra thrust to planned investment expen-
ditures. First, some industries will be trying to
"make up for lost time" in enlarging their
capacity. Primary material industries, for
example, are projected to need substantial
increases in plant and equipment after small
additions to capacity in recent years. Second,
businesses (as well as state and local govern-
ments) are expected to be spending more to
meet pollution control requirements. How-
ever, the fastest rising item on the investment
agenda is forecasted to be in the area of
energy—oil, gas, electricity, and nuclear
power. If energy supply is to keep pace with a
projected near doubling of demand over the
next decade, capital expenditures in the
energy industry may have to double their
(real) growth over that of the past ten years.

Planning Association, 1974); "The Capital Needs and
Savings Potential of the U. S. Economy: Projections
through 1985" (New York Stock Exchange, September
1974).
³Federal plus state and local government investment
projections will be implicit in the projections of (net)
government saving presented below. This procedure of
reporting projections only for the difference between
total receipts and expenditures of government is usually
followed in capital needs studies and for convenience is
used here.

³Expenditures on consumer durables, such as autos,
are included in consumption expenditures. Hence, this
item figures into determining households' savings.
<table>
<thead>
<tr>
<th></th>
<th>Historical</th>
<th>Brookings</th>
<th>Data Resources Inc.</th>
<th>Benjamin Friedman</th>
<th>General Electric</th>
<th>National Planning Assoc.</th>
<th>New York Stock Exchange</th>
</tr>
</thead>
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<tr>
<td><strong>A. Gross Private Domestic Investment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonresidential</td>
<td>15.1</td>
<td>15.6</td>
<td>15.3</td>
<td>15.8</td>
<td>16.3</td>
<td>16.4</td>
<td>16.4</td>
</tr>
<tr>
<td>Residential</td>
<td>3.7</td>
<td>3.5</td>
<td>4.0</td>
<td>3.5</td>
<td>4.0</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>B. Total Savings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>10.8</td>
<td>10.2</td>
<td>11.0</td>
<td>10.5</td>
<td>11.2</td>
<td>11.2</td>
<td>10.6</td>
</tr>
<tr>
<td>Personal</td>
<td>5.0</td>
<td>4.9</td>
<td>5.4</td>
<td>4.9</td>
<td>4.4</td>
<td>4.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Government</td>
<td>0.5</td>
<td>0.3</td>
<td>0.8</td>
<td>0.1</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Federal</td>
<td>-0.8</td>
<td>0.6</td>
<td>-1.0</td>
<td>-</td>
<td>N.A.</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>State &amp; Local</td>
<td>0.3</td>
<td>-0.3</td>
<td>0.3</td>
<td>-0.1</td>
<td>N.A.</td>
<td>-</td>
<td>0.1</td>
</tr>
<tr>
<td>Other b</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.1</td>
<td>0.3</td>
<td>-</td>
</tr>
<tr>
<td><strong>C. Capital Gap</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.9</td>
<td>-</td>
<td>-</td>
<td>2.1</td>
</tr>
</tbody>
</table>

2 For full references see footnote 1 in text of article. Details in table may not sum to totals due to rounding errors.
3 Statistical discrepancy less than foreign investment.

Source: Economic Report of the President, February 1975, Appendix C. These historical averages of private investment and savings (as a proportion of GNP) are slightly less than those calculated from Appendix B of the Economic Report of the President, February 1976, which contains the revised series of national income and product accounts. The old series is used here because they served as a basis on which the (pre-1976) capital needs projections were made.

This forecast appears to represent a predicted realization of a capital "scarce" in that high ex ante investment demands must be scaled down because of "inadequate" finance. See discussion of Major Assumptions, p. 5.
personal savings may slow. Still others speculate that recent years of high inflation could adversely affect families' traditional savings habits.

This savings outlook for businesses and households indicates that total private savings could be somewhat sluggish in the years ahead relative to historical trends (see Table 1). Contrasting this savings picture with that of rising investment demand has suggested to capital needs forecasters an important role for the Federal Government if a shortfall is to be avoided.

Help from Uncle Sam? Most forecasters visualize a continued growth in (real) Federal expenditures—particularly for national defense, income security programs and Federal pay raises. But with tax revenues also projected to shoot up, and with judicious management of expenses, Uncle Sam supposedly can come much closer to keeping his budget in balance than in the past. Reflecting this optimism, a significant drop in the Federal deficit is seen by a number of forecasters for the years ahead (see Table 1). Relatively less Federal borrowing will leave more saving for private investment, or so this argument goes.

With a greater restraint in Federal spending and deficits, most forecasters feel that our capital "needs" can be met (see Table 1). But to help ensure that an adequate amount of capital will be forthcoming, Uncle Sam is further being urged to provide extra incentives to savers. These additional policy recommendations include establishing a larger and more permanent investment tax credit, reducing the corporate income tax rate, and cutting back the tax rate on capital gains. With these tax inducements, businesses and households will supposedly have an incentive to save more. However, the wisdom of these policy suggestions depends, in part, on the importance we attach to the capital needs forecasts.

A Needed Perspective on Capital "Needs" Forecasts

Capital needs forecasts make an important point: you can't have your cake and eat it too. They emphasize that resources are scarce: the more society wishes to consume today, the less will be left over for investment. The greater the amount of capital devoted to cleaning up our environment, the less there may be for more autos or more homes. In setting our social priorities, it is thus important to consider what the capital (and other) costs are likely to be.

However, as a basis for policy action, the current studies and projections are deficient in three important ways. First, measures that might be appropriate for boosting capital growth over the long haul may have a perverse impact on an economy coming out of its worst recession since the 1930s. Second, long-term forecasts of capital demands and supplies are subject to potentially large errors. This could make them poor guides for policymakers. And third, the studies offer little evidence on the critical issue of whether society really benefits by encouraging capital growth.

The Policy Problem in a Time of Recession

Currently more than 7 percent of our labor force is out of work and our factories have been operating with historically large amounts of excess capacity. Some financial writers have suggested that the slow pace of investment and low economic growth brought on by the recession make our capital position even more precarious than was earlier anticipated. Their reasoning: we now have further to go to get where we want to be. But it should also be recognized that during a recession our capital "needs" are smaller and our capital stock is depleted more slowly than
when the economy is going at full steam. Taking this view, it might be that we don’t have to go as far as previously thought.

More important, the problem of recession can be one of too much rather than too little savings. As spending slowed during the latter part of 1974, production tapered off and unemployment rose. The result was a snowballing effect with spending slowing even further and more jobs being lost. Currently, an important problem facing policymakers is getting people back to work and existing plants and machines back into full gear. What this calls for is a healthy spending pace by consumers and government, as well as investors. An increase in spending provides producers with an incentive to boost output and pursue more optimistic investment plans. Thus, during periods of high unemployment, increased spending by consumers and Uncle Sam may very well help to increase, not reduce, private investment.

So whatever might be the merits of the capital scarcity thesis over the long haul, now may not be the best time to begin exercising great restraint on government spending, or to be implementing policies designed to increase savings. But even as we get back to full employment of our resources, there may still be good reasons to treat the notion of a capital scarcity with at least some degree of reservation.

How Reliable Are the Projections? A critical feature of any forecast is its reliability. Capital needs forecasters have provided no measures with which to judge their predictive abilities. However, several considerations suggest their predictions could easily be far off the mark. For one thing, prediction errors of near-term forecasts are often quite large even when using the best of models. The track record of one prestigious forecasting firm is particularly revealing (see Table 2). Its average error in predicting economic trends suggests that projecting capital needs and supplies just two years out could easily result in substantial errors.

Moreover, the longer we stretch the forecast horizon, the more prone to error the forecasts are likely to become (as suggested by Table 2). Capital needs projections have generally stretched out to about ten years. Even on the two-year forecast a word of caution is suggested: “The second year is only meant to be indicative of the general direction of the economy. . . .” The forecast errors “show just how much accuracy can be expected when we are as far away from the forecast base as two years. It should be sobering to policymakers and economists.”

In addition, long-term forecasts, particularly the capital needs forecasts, face several major obstacles in making accurate predictions. One, of course, is knowing the future underlying forces that will be affecting our economy. For example, the earlier capital needs studies (made during 1973 and 1974) assumed that the mid-seventies would be a period when the economy was operating at or near full employment rather than being in the doldrums of a deep recession. But even if we guess correctly on the basic forces, economic behavior still remains hard to predict. For example, it is suggested that households’ savings may be shrinking (relative to GNP) because of rising tax rates, a shift in the population mix toward young families, and inflation. However, the speculative nature of this suggestion is indicated by the fact that each of these forces has been operating since the mid-sixties, yet personal savings rates have been rising.

More fundamentally, the forecasts take only a limited account of the long-term interrelationships of a market economy and its...
### TABLE 2

**FORECASTING ERRORS TEND TO GROW WITH LENGTH OF FORECAST HORIZON**


<table>
<thead>
<tr>
<th>Variable</th>
<th>Quarters Ahead</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Gross National Product</td>
<td>(current $)</td>
</tr>
<tr>
<td></td>
<td>(1958 $)</td>
</tr>
<tr>
<td>Consumer Expenditures</td>
<td>(current $)</td>
</tr>
<tr>
<td></td>
<td>(1958 $)</td>
</tr>
<tr>
<td>Nonresidential Investment</td>
<td>(current $)</td>
</tr>
<tr>
<td></td>
<td>(1958 $)</td>
</tr>
<tr>
<td>Residential Investment</td>
<td>(current $)</td>
</tr>
<tr>
<td></td>
<td>(1958 $)</td>
</tr>
<tr>
<td>Inventory Change</td>
<td>(current $)</td>
</tr>
<tr>
<td></td>
<td>(1958 $)</td>
</tr>
</tbody>
</table>


Note: The average absolute errors measure the average of the absolute value of the forecasted numbers minus the actual numbers for the respective economic variables over the respective time horizons. Because most of these variables tend to grow over time (inventory change being the exception), errors are likely to expand with the forecast horizon due simply to an increasing scale. However, for most of these variables, the size of the error growth suggests that even a relative measure, such as the mean absolute percentage error the absolute prediction error divided by the actual value of the respective variable, would also be likely to exhibit growth. Finally, it should be emphasized that the forecast errors reported here are those of a short-term forecasting model and are used primarily to illustrate the difficulty of accurate forecasting, particularly as the forecast horizon expands. They are not intended to portray the likely size of prediction errors of long-term forecasts since there is, in fact, little if any evidence on the likely accuracy of long-term forecasts.

Response to changing demand and supply conditions. For example, forecasts of substantial growth in oil demands appear to be little influenced by a sharp rise in the relative price of oil. Such an assumption gives short shift to price-induced responses, such as a possible trend to small gas-saving cars, development of less energy-intensive production processes, or a substitution of less expensive Needs in the Seventies, pp. 26-31. For a more general discussion of the role of market prices in eliminating "shortages" see Donald L. Raiff, "Shortages: A Necessary Evil of the Future?" Business Review, Federal Reserve Bank of Philadelphia, October 1974, pp. 12-23.
energy sources for oil. Yet, these responses—motivated by profit considerations—may in the end help cut our investment demands. 

Similarly, the procedure of simply adding up the savings projections of households, businesses, and government may give rise to errors in the total because of interrelationships among the components. If government curbs its deficits by reducing expenditures on goods and services (such as medical care) this could cause households to increase their consumption and cut back on savings. Tax measures designed to encourage businesses to increase their retained earnings may cause a substitution of business savings for personal savings. These possibilities are given little attention in the capital needs studies.

In sum, what we know about forecasting suggests that, beyond a few years, predictions of components of investment demand and saving may be subject to large errors. The potential for error may be sufficiently great as to question the meaningfulness of decade-long projections of our capital adequacy.

Capital Growth and Social Goals. Perhaps the real issue underlying the concern over capital scarcity is whether society benefits from higher rates of capital growth. Those seen as sharply expanding investment demands warn that failing to finance them—particularly business investment—will retard our economic growth and aggravate inflation and unemployment too—see Box.

Hence, Uncle Sam should curb his spending and provide special tax incentives to encourage saving and investment, or so these analysts contend. But even if investment demands do expand, the case for government support is not all one-sided.

For one thing, the link between capital accumulation and economic progress is much less firmly established than is often presumed in the capital needs thesis. Explaining what makes a country more affluent is a tough nut that economists have only begun to crack. Obviously, the number and quality of machines that laborers have to work with is one important factor. But studies of economic growth suggest it’s not the only important ingredient. Other factors also rated as important contributors to economic expansion are technology, education, and production efficiency in resource use. Consequently, whether a modest decline in the rate of capital expansion would significantly pull down our economic growth is uncertain.

Moreover, society’s well-being can be judged with a variety of yardsticks. The rate of expansion in GNP is one important indicator.

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(1) Studies of economic growth in the U.S. and Western Europe have generally been able to explain only a minor part of this growth in terms of capital accumulation. Moreover, some of these studies indicate that the relatively high investment-GNP ratios and high economic growth rates observed in Western European countries (and often cited by capital scarcity proponents) are misleading as an indicator of a cause-effect relationship. For one thing, it is explained that capital goods in Western Europe have much higher price tags compared to other goods than they do in the U.S. When account of these relative price differences was taken for a number of Western European countries, their investment-GNP ratios turned out to be no greater than that in the U.S. over the same time period. Second, at least one study found that capital growth accounted for only 13 percent of economic growth in North-Western European countries between 1950 and 1962. The fact that these countries had appreciably higher economic growth rates than the U.S. was explainable almost entirely by differences in stages of economic growth and a removal of international trade barriers. For a review of these studies, see Hang-Sheng Cheng, “Investment Ratios and Economic-Growth Rates,” Business Review, Federal Reserve Bank of San Francisco, Spring 1974.

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(2) Total private savings during the twentieth century has averaged about 15.5 percent of GNP, exhibiting a remarkable stability despite rather significant variation in its separate components: personal savings, durable expenditures, and business savings. One explanation offered for this observation is a long-term stable propensity for society to invest its income and a treatment of business and government savings as highly substitutable for personal savings. The implication of this thesis for the capital needs studies is that the procedure of simply adding up individually estimated savings projections for household, government, and business is incorrect. For one recent study of this issue see Paul O. David and John L. Scadding, “Private Savings: Irrationality, Aggregation, and Denison’s Law,” Journal of Political Economy 82 (March/April 1974), pp. 225-49.
Reducing inflation and unemployment are often cited as objectives for encouraging capital growth. If a higher rate of investment increases economic growth, it might help curb inflation. The basis for this contention seems to be that, with greater production, families will have more goods and services on which to spend their incomes. With more output per dollar of expenditure, prices (or inflation) will be forced down. There are, however, at least two important uncertainties which are usually neglected in presenting this argument. One is the amount of increase in investment it will take to measurably expand our economic growth. The link between capital accumulation and economic growth is more tenuous than often presumed in the capital scarcity thesis (see text of article).

The other uncertainty is whether people’s incomes will actually grow more slowly than the higher rate of production. This will depend on how fast Uncle Sam is supplying money to the economy. If monetary growth accelerated with economic growth, so too will the amount of money people have to spend. Consequently, there will be no downward pressure on inflation. In fact, many argue that accelerating monetary growth has been a main ingredient in producing the rising inflation over the past 10 to 15 years. While this need not continue in the future, it does suggest the stability of monetary growth is not something to be taken for granted.

Economic theory also suggests there may be a link between capital growth and unemployment. High capital growth, which increases worker productivity, could over the long haul increase employers’ demands for labor, reducing the rate of unemployment. But again, there are several caveats which make the argument somewhat tenuous. One is, as before, the uncertainty of the precise relation between capital growth and labor productivity. The other issue is the type of capital that would be more rapidly accumulated. Different forms of capital can have different effects on the best way for producers to combine their inputs. If the type of capital being accumulated was of the labor-saving variety, it could have a long-term effect of substituting for labor. In this case, more rapid capital growth need not reduce the unemployment rate. These uncertainties need to be weighed when considering capital growth policies for the purpose of reducing inflation or unemployment.


but there are others as well: the level of (current) consumption (both private and public), the welfare of the old or disadvantaged, the quality of our environment, to name a few. In the presence of scarce resources, there are trade-offs among these various objectives. Those who would like to see our economic growth reach the higher rates of many West European countries (prior to the 1974-75 recession) are apt to view our capital growth as being too small and our consumption and social welfare programs as being too large. But, just as certain, there are others who would judge that a relatively strong demand
for consumer goods, social programs and environmental safeguards more or less accurately reflects our preferences, both as individuals and as members of society at our present stage of economic development.

In short, the debate over a capital scarcity is, to an important degree, a debate over the best uses of our scarce resources: investment versus consumption and public versus private spending. In the end, resource use should reflect our individual and collective choices. Only by a careful weighing of the arguments for encouraging capital formation and the accompanying costs can the most appropriate governmental actions be expected. To date, studies projecting capital needs have generated more heat than light with respect to this issue.

**CAPITAL NEEDS PROJECTIONS: A USEFUL START, BUT A LONG WAY TO GO**

Capital needs forecasts emphasize that we can't set national economic priorities willfully of available resources. They point the way for policymakers to plan ahead on the costs of setting social objectives such as pollution control or energy availability. But the actual "numbers" and, in some cases, the coming squeeze on capital being predicted by forecasters is subject to some serious reservations. First, the problem of the recent recession and current recovery has been one of excess capital or saving rather than a capital deficiency. Second, there are substantial methodological hurdles that need to be overcome before a good deal of confidence can be placed in long-term forecasting. Current capital needs and supply predictions are much more speculative than definitive and may not provide a firm foundation for building policy. And finally, warnings of an impending capital squeeze reflect, in part, the personal judgment of forecasters or analysts as to the value of private investment versus private and public consumption. In considering policy recommendations emerging from the capital scarcity thesis, these reservations ought to get their due if society's overall welfare is to be served.
ECONOMICS
of INFLATION

Inflation is currently a major problem facing the U.S. Can policymakers curtail it? If so, how much will their actions "cost" society? Is inflation "bad," and if so, why? Are there ways of "living with inflation" that cushion its negative impact on the individual and society? Six articles reprinted from the Philadelphia Fed's Business Review address these questions in detail and seek to promote an understanding of the problem for both policymakers and the general public.

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