

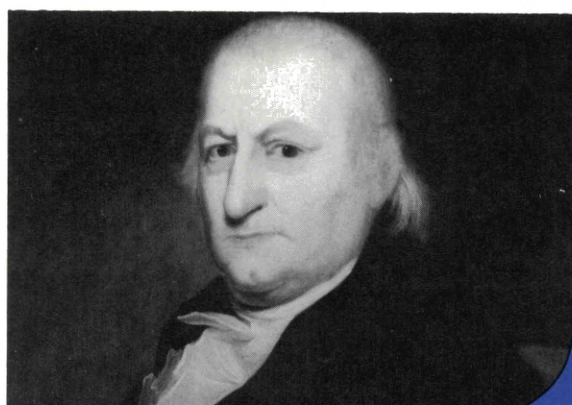
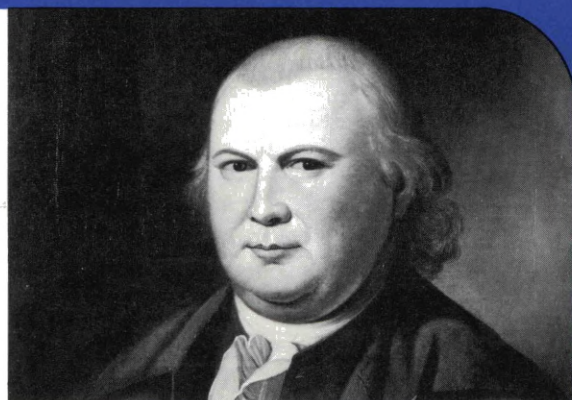
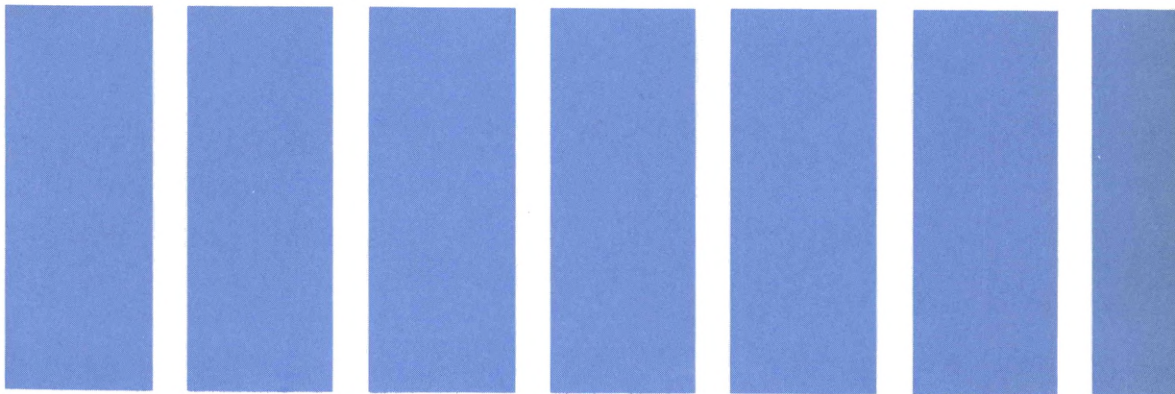
BUSINESS REVIEW

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Capital Needs Projections: A Need for Perspective

Profit in a Free Economy

The FED in Print





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. . . Though small in percentage terms, corporate profits are an effective incentive to economic growth. Society's task is to gain from the beneficial uses of the profit mechanism and to discourage the harmful ones.

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

George Clymer (1739-1813), upper left. Merchant, member of the Pennsylvania Assembly, signer of the Declaration of Independence, and first president of the Philadelphia Bank. Portrait by Charles Wilson Peale (1741-1827), courtesy of the Pennsylvania Academy of the Fine Arts.

Aaron Levy (1742-1815), lower right. Wealthy merchant and creditor to the Continental Congress. Portrait by Robert Edge Paine (ca. 1730-1788), courtesy of the Historical Society of Pennsylvania.

Robert Morris (1734-1806), upper right. Signer of the Declaration of Independence, Superintendent of Finance to the Continental Congress, and founder of the Bank of North America. Portrait by Charles Wilson Peale, courtesy of Independence National Historical Park, Philadelphia.

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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Capital Needs Projections: A Need for Perspective

By James M. O'Brien

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.¹ Generally, the predictions have been

¹The following description of capital needs studies is based on a representative sample of recent reports on capital adequacy and includes: Barry Bosworth, James S. Duesenberry, Andrew S. Caron, *Capital Needs in the Seventies* (Washington: The Brookings Institution, 1975); Benjamin M. Friedman, "Financing the Next Five Years of Fixed Investment," Discussion Paper Number 389 (Cambridge: Harvard Institute of Economic Research, November 1974); Allen Sinai and Roger E. Brinner, "The Capital Shortage: Near-Term Outlook and Long-Term Prospects," Economic Studies Number 18 (Cambridge, Mass.: Data Resources, Inc., 1975); "Capital Requirements of Business, 1974-85" (New York: General Electric, March 8, 1974); Robert Dennis, "Clambering in the

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 economic growth, making it difficult to maintain our current standard of living.

Expanding Investment Demands. On balance, 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 expenditures. 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 governments) are expected to be spending more to meet pollution control requirements. However, 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.

Eighties," Report Number 74-N-1 (Washington: National Planning Association, 1974); "The Capital Needs and Savings Potential of the U. S. Economy: Projections through 1985" (New York Stock Exchange, September 1974).

²Federal 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.

(See Table 1 for nonresidential investment projections.)

Capital outlay plans of households, mainly expenditures for new homes, are not expected to show the same strength as business spending.³ Despite continued support from Uncle Sam, little growth and possibly even some decline is predicted for housing construction (as a share of GNP) over the next decade (see Table 1). The main factor shaping this picture is a predicted fall-off in the rate of family formation. A second factor sometimes cited is the increased popularity of lower-cost apartments and mobile homes.

When projected capital demands of businesses are added to those of households, we get the total picture of private investment demands for the next decade. The prognosis generally appears to be for a sizeable (but not extreme) increase in our capital "needs" for the future (see Table 1). But will our savings be sufficient to meet these capital demands?

The Uncertain Savings Picture. In the opinions of the capital needs forecasters, the savings outlook is more clouded than the future investment picture. Perhaps because there is only a little to go on, the average forecast for business savings tends to hover pretty close to past trends. But there appears to be a general concern that households may be less inclined to save as much as in the past. Various reasons are offered to explain this darker picture for household savings. One is the combination of a progressive Federal income tax and rising incomes. As incomes go up (partly because of inflation), our graduated income-tax structure means that Uncle Sam will be taking an increasingly larger tax bite. Hence, families will have relatively less income to save. Another factor cited by some who see less growth in savings is the shift in population mix toward young families. Since they tend to save a smaller share of their earnings than do middle-aged families, total

³Expenditures on consumer durables, such as autos, are included in consumption expenditures. Hence, this item figures into determining households' savings.

TABLE 1
PROJECTIONS OF CAPITAL NEEDS AND SUPPLIES^a
(As percent of GNP)

	Historical ^c 1965-74	Brookings 1980	Data Resources Inc. 1977-85	Benjamin Friedman 1977-81	General Electric ^d 1974-85	National Planning Assoc. 1974-85	New York Stock Exchange 1974-85
A. Gross Private Domestic Investment	15.1	15.6	15.3	15.8	16.3	16.4	16.4
Nonresidential	10.4	11.3	10.6	11.5	12.0	12.3	12.1
Inventory	1.0	0.8	0.7	0.8	0.3	0.7	0.3
Residential	3.7	3.5	4.0	3.5	4.0	3.5	4.0
B. Total Savings	15.1	15.6	15.3	15.8	15.4	16.4	14.3
Business	10.8	10.2	11.0	10.8	11.2	11.2	10.6
Personal	5.0	4.9	5.4	4.9	4.4	4.8	4.0
Government	- 0.5	0.3	- 0.8	- 0.1	- 0.3	0.1	- 0.3
Federal	- 0.8	0.6	- 1.0	—	N.A.	0.1	- 0.2
State & Local	0.3	- 0.3	0.3	- 0.1	N.A.	—	- 0.1
Other ^b	- 0.2	0.2	0.2	0.2	0.1	0.3	—
C. Capital Gap	—	—	—	—	0.9	—	2.1

^a For full references see footnote 1 in text of article. Details in table may not sum to totals due to rounding errors.

^b Statistical discrepancy less net foreign investment.

^c 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.

^d In a more recent forecast ("Economic Prospects, 1975-85," March 14, 1975), General Electric predicts that private investment will average only 14.4 percent of GNP between 1975 and 1985 and there will be no capital gap (using benchmark periods between 1975 and 1985). This forecast appears to represent a predicted realization of a capital "scarcity" 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.⁴ 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 policy-makers. 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

⁴At the state and local government level, forecasters generally see reduced capital expenditures in the important areas of highways and public education and increased investment in pollution control and public transportation. On current account, state and local budgets are expected to remain in surplus. When projected debt financing is added to this surplus, a relatively small overall deficit is generally being projected. See, for example, Barry Bosworth et al., *Capital Needs in the Seventies*, pp. 40-42, and the New York Stock Exchange, "Capital Needs and Savings Potential," p. 11.

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), and 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."⁵

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.⁶ 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 speculativeness 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.⁷

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

⁵George R. Green and Lawrence R. Klein, "The Wharton Forecast Record: A Self Examination," *Wharton Quarterly* (Winter 1972-1973), p. 27.

⁶See, for example, Bosworth et. al., *Capital Needs in the Seventies*; and "Outlook to 1985," *Quarterly Review of Economic Prospects* (General Electric, March 1974).

⁷Personal savings relative to GNP averaged 4.4 percent between 1955 and 1959, 3.6 percent between 1960 and 1964, 4.4 percent between 1965 and 1969, and 5.1 percent between 1970 and 1974. See the *Economic Report of The President*, 1976, Appendix B. For inflation, population and tax trends also see Appendix B.

TABLE 2
FORECASTING ERRORS TEND TO GROW WITH LENGTH OF
FORECAST HORIZON
(Average Absolute Errors of Predicted Levels for Wharton
Forecasts, 1967:I-1972:III)*
(Billions of Dollars)

Variable		Quarters Ahead							
		1	2	3	4	5	6	7	8
Gross National Product	(current \$)	3.47	7.21	8.50	9.25	12.12	16.80	20.60	24.58
	(1958 \$)	2.34	4.88	6.32	6.49	7.08	7.52	10.87	15.24
Consumer Expenditures	(current \$)	2.22	4.33	6.05	7.57	11.20	14.18	16.76	19.31
	(1958 \$)	1.85	3.25	3.98	4.59	5.06	5.73	6.10	6.20
Nonresidential Investment	(current \$)	2.23	3.11	3.68	4.64	5.55	7.05	7.82	9.00
	(1958 \$)	1.81	2.57	3.08	3.55	3.45	3.70	3.69	4.00
Residential Investment	(current \$)	1.11	1.83	2.17	3.02	4.13	5.09	6.59	8.90
	(1958 \$)	0.68	1.11	1.33	1.95	2.57	2.99	4.45	5.81
Inventory Change	(current \$)	2.26	3.30	4.48	3.81	3.22	3.52	2.94	2.39
	(1958 \$)	1.60	2.98	3.61	3.07	3.64	3.48	2.69	1.87

*Source: George R. Green and Lawrence R. Klein, "The Wharton Forecast Record: A Self Examination," *Wharton Quarterly*, Winter 1972-1973, pp. 22-28. A detailed report of the forecast evaluation can be found in the article.

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.⁸ Such an assumption gives short

shrift 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

⁸See "Energy Demand Studies: An Analysis and Appraisal," U. S. House of Representatives, 92nd Congress, September 1972. Also see Bosworth et. al., *Capital*

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. 13-23.

energy sources for oil. Yet, these responses—motivated by profit concerns—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.⁹ 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 seeing sharply expanding investment demands warn that failing to finance them—particularly business investment—will retard our economic growth (and exacerbate inflation and unemployment too—see Box).

⁹Total 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 households, government and business is incorrect. For one recent study of this issue see Paul O. David and John L. Scadding, "Private Savings: Ultrarationality, Aggregation, and 'Denison's Law,'" *Journal of Political Economy* 82 (March/April 1974), pp. 225-49.

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 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.¹⁰ 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

¹⁰Studies 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 Northwest 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.

BOX

CAPITAL GROWTH, INFLATION AND UNEMPLOYMENT

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 peoples' 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 some 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.

*For a more detailed discussion of this view of the long-term relation between inflation and the money supply, see James M. O'Brien, "Inflation and a Role for Monetary Policy," *Business Review*, Federal Reserve Bank of Philadelphia, December 1973, pp. 3-11.

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.

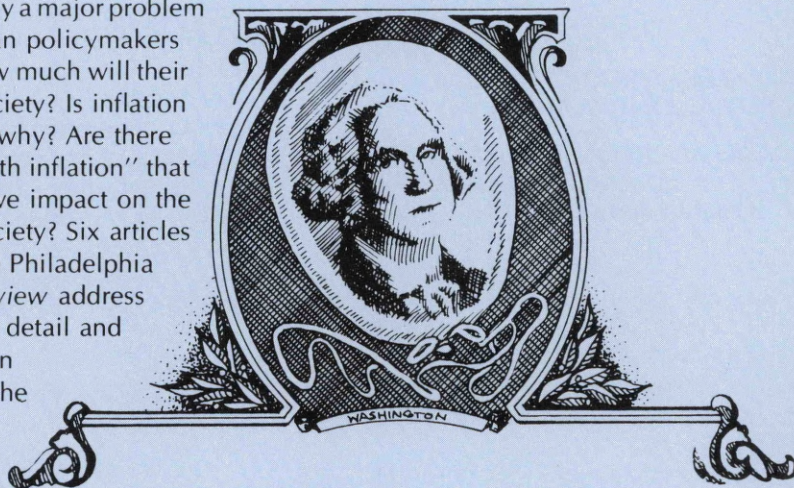
CAPITAL NEEDS PROJECTIONS: A USEFUL START, BUT A LONG WAY TO GO

Capital needs forecasts emphasize that we can't set national economic priorities willy-nilly 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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Profit in a Free Economy

By John J. Seater

Profit, like politics and religion, is a subject that evokes strong feelings and hot arguments. At one extreme, profit is said to be the fruit of shameless exploitation that cheats the consumers, pollutes the environment, and oppresses the workers. At the other extreme, profit is said to be the reward for hard work, risky investment, and clever innovation—enterprises that have no undesirable consequences and that in fact are indispensable for social welfare and progress.

Neither of these extreme views is accurate, but each does contain elements of truth. Fundamentally, profit is simply a tool for achieving social goals. However, like a pistol or a scientific discovery, the profit tool can be misused. Thus society's task is to construct safeguards that prevent, or at least discourage, the objectionable uses of the profit mechanism but that still allow society to gain from the beneficial uses.

PROFIT: WHAT IS IT AND HOW MUCH IS THERE?

Profit is simply the difference between

revenue and cost.¹ In economic terms, it is the return to the owners of capital—the capitalists. Capital is any product used to produce another product, such as a printing press or an oil refinery. The owners of capital are those having legal claim to the capital equipment; for the most part, they are the stockholders of the nation's companies. Stockholders receive their profit in two forms. Some is received as annual dividends. The rest is reinvested in the company, thus building the value of the company's stock; this profit is eventually captured when the stock is sold.

How much profit do capitalists make? One way to answer this is to look at the profit

¹Actually, profit is not a simple concept. Throughout this article, profit will be the difference between *explicit* revenue and cost; this is often called the accounting definition of profit. Explicit costs, for example, are employees' wages, raw materials costs, machine rentals, taxes, and so on. Economists use a more subtle definition of profit—the difference between revenue and costs, both explicit and *implicit*. An implicit cost is, for example, the salary that the owner of a business could have made in his highest paying alternative occupation.

rate—that is, profits relative to production costs. People generally estimate the profit rate to be quite large. For example, in a recent survey, the average person guessed the *after-tax* profit rate of manufacturing corporations in 1974 to be 33 percent.² In fact, however, the after-tax profit rate in manufacturing was 5 percent. A second way to look at the size of profits is to examine the share of the national income earned as profit. In the United States, after-tax corporate profits have averaged

about 6 percent of national income over the last 45 years; even the *before-tax* rate has been only 11.5 percent (see Table). Moreover, a recent study argues that profits as a share of national income have been falling since World War II.³ In short, corporate profit rates, on average, are smaller than many people believe and may not even be growing as fast as national income.

PROFIT: A VALUABLE SOCIAL TOOL

Profit has been defined as the monetary

²Estimates of particular profit rates are even more strikingly incorrect. For example, the average person felt the after-tax profit rate of petroleum companies was 61 percent in 1974; in fact, it was 7.2 percent. The survey was conducted by the Opinion Research Corporation of Princeton, New Jersey. It is reprinted in *New Jersey Business*, August 1975, pp. 25-27.

³See William D. Nordhaus, "The Falling Share of Profits," *Brookings Papers on Economic Activity*, No. 1 (1974): 169-217. Nordhaus has adjusted the profit data somewhat, so they are not perfectly comparable to those presented in the table.

AFTER-TAX PROFITS HAVE AVERAGED ABOUT SIX PERCENT AS A SHARE OF NATIONAL INCOME

	(A)	(B)	(C)	(D)	(E)
	Net National Product (Billions of Dollars)	Net Corporate Profits Before Taxes (Billions of Dollars)	Net Corporate Profits After Taxes (Billions of Dollars)	Before-Tax Corporate Profit Rate (Column B Divided by Column A x 100%)	After-Tax Corporate Profit Rate (Column C Divided by Column A x 100%)
1929	\$ 95.2	\$ 10.0	\$ 8.6	11%	9%
1933	48.6	1.0	0.4	2%	1%
1939	83.2	7.0	5.6	8%	7%
1940	92.2	10.0	7.2	11%	8%
1945	200.7	19.7	9.0	10%	4%
1950	266.4	42.6	24.9	16%	9%
1955	366.5	48.6	27.0	13%	7%
1960	460.3	49.7	26.7	11%	6%
1965	625.1	77.8	46.5	12%	7%
1970	889.8	74.0	39.3	8%	4%
1971	961.2	83.6	46.1	9%	5%
1972	1055.1	99.2	57.7	9%	5%
1973	1184.1	122.7	72.9	10%	6%
1974	1277.2	141.0	85.2	11%	7%

Data from *Economic Report of the President, 1975*.

return to the owners of capital. Why should capitalists be rewarded at all? The answer is simple. If a society decides that forcibly coercing individuals to produce certain goods and services is undesirable, then there must be some other incentive to encourage people to commit resources, such as time and money, to production. Presumably, the probability of earning a money return that exceeds the costs of production (that is, of earning a positive profit) will make production attractive. Thus profit can act as the desired incentive. Furthermore, profit fulfills a broader social function than simply encouraging production. It also serves as a signal of the kinds of goods and services that society deems most valuable.

The Individual's View. From an individual capitalist's point of view, profit has three functions. First, some of the profit is a payment for investing his money in capital equipment instead of spending it elsewhere. The capitalist's money is like the laborer's time. A laborer can spend his time either relaxing or working. He will work only if he is paid enough to be compensated for not relaxing. Similarly, a capitalist will buy a factory or a machine only if he earns more that way than by doing something else with his money, such as depositing it in a bank. So, much of what is called profit is merely interest on the capitalist's money.

Second, some of the profit is compensation for the risk a capitalist assumes in investing in uncertain enterprises. Everyone knows that buying stocks is riskier than putting money in a bank account. The firm whose stock you buy may suffer a decline in sales or, worse, go out of business. Either way, the value of the stock falls, possibly to nothing. No such thing happens with a bank account. The money value of a bank deposit cannot decline (except possibly in the case of bankruptcy), and it is possible to earn a guaranteed interest rate. Moreover, deposits in amounts up to \$40,000 are insured against default at almost all banks. Obviously, under these conditions, no rational person will buy stock rather than

open a bank account unless the expected return on the stock exceeds the expected return on the bank account by enough to make the extra risk worth taking. This extra compensation for risk is another element of what is called profit.

Third, part of profit is a reward for enterprise and invention. Invention usually occurs because the inventor sees it as a means of earning money. So, part of profit is a compensation for the inventor's effort and insight. Profits of this kind usually are temporary, being ultimately competed out of existence as rivals and imitators adopt the technique. But as one source of innovational profit disappears, another arises somewhere else in the economy so that there is always some innovational profit in existence.

Society's View. The pursuit of profits by individuals also produces gains for society. Profits provide the incentive for capital formation and hence for economic growth. By providing interest on the capitalist's investment, compensation for risk, and reward for inventiveness, profits create incentives to invest money in the machines and factories needed for economic progress. In more general terms, profits signal to producers which goods are most desirable to society. (As we shall see shortly, the signal sometimes may be imperfect.)

A timely illustration of this is the development of the energy industry. Before industrialization, fuel production was minimal. Some coal and wood was used for heating purposes and for forging tools, but most other energy demands were met with wind and water power and with the labor of men and their beasts of burden. Petroleum was merely an object of curiosity. With the emergence of industrialization, however, energy demands multiplied enormously. It quickly became *profitable* to extract coal and petroleum in huge quantities and refine them for various uses. People wanted the products offered by industrialization. In response to the profit that those new desires made possible, resources were diverted from other uses to the production of the energy needed to fuel the indus-

trial machine. Thus, it was the lure of profit that organized resources so as to satisfy the desires of society. Now petroleum is becoming scarcer, and petroleum prices are rising. The result? Predictably, new profit opportunities have developed. Oil companies now find it profitable to pump out of the ground petroleum that was formerly too expensive to recover. Research is being devoted to producing petroleum products from nonpetroleum sources, such as coal, and also to finding alternative sources of energy. So profit once again is leading businessmen and entrepreneurs, through their own self-interest, to satisfy some of the desires of society.⁴

PROFIT: A LESS-THAN-PERFECT MECHANISM

Thus it is clear that profit seeking can produce desirable ends. However, the profit mechanism can yield some undesirable outcomes as well. Social ills such as fraud and pollution often are attributed to profit-seeking, and the charge that profits are excessive and result in the exploitation of workers is a familiar and long-lived assertion.

Are Profits Excessive? The term “excess profits” is used frequently and is a cornerstone of some political ideologies. In a broad sense, we can say that profits are excessive when they are larger than is required to carry out the functions of profit—to encourage production and signal scarcities.

Excess profits arise whenever industries are not effectively competitive.⁵ A lack of compe-

⁴A different way to see the importance of profit in governing production is to examine the meat shortage of 1973. The price controls then in effect made it impossible for producers to satisfy demand and still earn a profit. Beef producers left their cattle to graze rather than bring them to market at the controlled prices. Chicken raisers even killed many of their young chickens rather than bear the expense of raising them only to have to sell at a loss at the artificially low prices. The moral is simple and clear: no profit, no production.

⁵An industry may not be perfectly competitive but may be “perfectly competitive enough for all intents and

tion means that firms can restrict output and create artificial scarcities to increase the price of their product and thereby earn excess profits.⁶

If we can gauge the extent of noncompetitive enterprise in the U. S., we can get a rough idea of the magnitude of excess profits in our economy. The task is difficult, but some attempts have been made. A study in 1951, covering the years 1899 to 1939, found that private noncompetitive industries produced about 15 percent of the Gross National Product in the U. S.⁷ A more recent study found that the extent of noncompetitive enterprise in manufacturing industries showed no marked tendency to increase or decrease between 1947 and 1966.⁸ If nonmanufacturing industries also experienced little change during this period and if there were no sharp changes in the degree of competition in the economy during World War II, then we can estimate that noncompetitive enterprise continues to account for about 15 percent of the national product.

There is also some recent evidence that even when businesses operate in a noncompetitive environment, they are not very effective in raising prices above the competitive level. One study estimates that noncompeti-

purposes,” in which case it is said to be effectively or workably competitive. See F. M. Scherer, *Industrial Market Structure and Economic Performance* (Chicago: Rand McNally and Company, 1970), pp. 36-38, for a discussion of the criteria for workable competition.

⁶See Paul A. Samuelson, *Economics*, 9th ed. (New York: McGraw-Hill Book Company, 1973), Chaps. 25 and 26, for a good discussion of the economics of noncompetitive industries.

⁷G. Warren Nutter, *The Extent of Enterprise Monopoly in the United States, 1899-1939* (Chicago: University of Chicago Press, 1951).

⁸*Studies by the Staff of the Cabinet Committee on Price Stability* (Washington, D. C.: U. S. Government Printing Office, 1969). Note that the findings deal with manufacturing only. Though not indisputably true, it seems reasonable to assume that there was no marked change in noncompetitiveness in nonmanufacturing sectors as well.

tive industries sell at prices that are on average about two percent higher than they would be if the industries were competitive. Such a small effect on prices suggests that the effect on the total size of profits is small, too.⁹

If these various studies are valid, it seems fair to conclude that, though there are some excess profits in the U. S. economy, they probably are not large and by no means dominate the corporate profit picture (see Box). However, an absence of excess profits does not let the profit system off the hook in the minds of many. What about fraud, pollution, and exploitation of labor?

Information Costs Allow the Profit System to be Misused. Information about almost anything is costly to obtain, usually requiring expenditure of time as well as money. In instances where the costs of gathering information are high, some firms may try to make a profit by cheating, that is, by misinforming consumers. A supplier may figure that if he provides incorrect or incomplete information, customers will buy his product, believing it better than it really is. Thus, the supplier could charge more than the product is “worth” and thereby earn an excess profit. However, excess profits from cheating typically will disappear over time. There are two reasons why. First, the supplier may lose business as people eventually learn he cannot be trusted. Second, even if cheating pays in the sense that people do not recognize the deception, other fraudulent suppliers will appear and drive the excess profit down to

zero.¹⁰ Eventually, then, business will settle down to a state in which some suppliers are frauds but in which there is *no* excess profit.

In the long run, then, excess profit stemming from deception is not likely to be a problem, but deception itself may be a burden. Here is an instance where it seems reasonable to attack an undesirable use of the profit mechanism rather than the mechanism itself. One way to do so is to make the objectionable means of profit seeking unprofitable. For example, society makes fraud costly by making it illegal and by imposing heavy penalties.¹¹

Pollution: An Uncounted Cost. Another problem often associated with profit seeking is pollution. Pollution is an example of what economists call an external cost, which is a cost not borne by those responsible for it. For example, paper mills are notorious for emitting foul odors, which are a cost to the local residents.

If there is no compensation for the emission of odors, the paper mill evades one of its costs, which is borne instead by the local residents. This reduction in the mill’s costs tends to produce excess profits. However, as with fraud, these excess profits are not likely to last because they will induce other firms to enter the paper mill business and force the

¹⁰The obvious exception is noncompetitive enterprise. A monopolist, for example, does not have to worry about other suppliers competing excess profit away from him. Thus, he may be able to earn excess profits from fraud.

¹¹However, even when providing incomplete or incorrect information is legal, it is still undesirable. This is why many economists agree that one social responsibility businessmen have is to provide the best information they have on their product, whether legally required to do so or not. Information can be quite costly to provide, though. If it is of little value, it probably is better not to bother providing it. Thus either the businessman or the government must decide whether to provide certain information. In either case, the decision is a difficult one, for the costs and benefits involved often are difficult to determine. See Kenneth J. Arrow, “Social Responsibility and Economic Efficiency,” *Public Policy*, Summer 1973, pp. 303-317; and Milton Friedman, *Capitalism and Freedom* (Chicago: University of Chicago Press, 1962), p. 133.

⁹See Richard A. Posner, “The Social Costs of Monopoly and Regulation,” *Journal of Political Economy* 83 (1974): 807-27. A small total (or absolute) change in excess profits could be accompanied by a large percentage change. For example, suppose initially that excess profit is zero when a firm manages to exploit its monopoly power to raise prices by two percent and thereby create an excess profit of one dollar. Then the percentage rise in excess profit is infinite, even though the absolute rise of one dollar is miniscule. This is why the percentage change in profit can be a misleading indicator of the change in the size of profit relative to national income.

BOX

WHY NONCOMPETITIVE INDUSTRIES GET SO MUCH ATTENTION

There are several reasons why the man in the street might overrate the extent of noncompetitive industries and their profits. First, noncompetitive industries—especially monopolies—are newsworthy. Many people would be interested to learn that the Justice Department is scrutinizing IBM for monopolistic behavior, but almost no one would care to hear that this year, once again, saw and planing mills operated in a competitive environment. It is something like traffic accidents—if someone is hit crossing the street, it's news; if he crosses safely, no one cares.

Second, bigness is often confused with monopoly. In fact, however, a firm does not have to be big to be a monopoly, and a big firm may belong to a competitive industry. For example, the Besser Manufacturing Company was found guilty in 1951 of illegally monopolizing the concrete-block machinery industry, even though it employed only 465 people at the time and had sales of less than \$15 million. In contrast, Cities Service Oil Company had sales of \$1.2 billion in 1965 but accounted for less than 3 percent of U. S. crude petroleum refining.^A

Third, most people seem to have manufacturing in mind when discussing the extent of noncompetitive behavior. Indeed, noncompetitive behavior apparently is more important in manufacturing and mining than in any other sector of the private economy, but manufacturing and mining are not the whole story. Two-thirds of national output is produced in other sectors, many of which are highly competitive.^B

People also may underestimate the natural economic forces tending to limit noncompetitive behavior. The most important force is profit itself. If a noncompetitive industry has excess profits, entrepreneurs enter that industry to capture some of the excess profits for themselves. Incoming firms make the industry more competitive, however, and the excess profit is driven down toward zero.^C Other forces also limit noncompetitive behavior—technological advances in transportation and communication, for example. Cheap transportation enables consumers to visit distant stores where prices may be lower. It also enables distant suppliers to ship their goods to new markets. Foreign cars in the American automobile market are an example. In both cases, competition is increased.

There are situations, however, where these competitive forces are absent. One case is “natural monopoly,” in which technical considerations make it much cheaper for one

^A These examples are taken from F. M. Scherer, *Industrial Market Structure and Economic Performance* (Chicago: Rand McNally and Company, 1970), p. 11.

^B Even in manufacturing and mining, noncompetitiveness may not be as extensive as popularly believed. Only about a fifth of the output of this sector comes from industries in which four firms account for 60 percent or more of sales. See Richard A. Posner, “The Social Costs of Monopoly and Regulation,” *Journal of Political Economy* 83 (1974): 819.

^C The railroads, for example, are no longer a monopoly; airplanes, buses, and automobiles have provided new modes of transportation for people and airplanes and trucks have provided new modes of transportation for goods.

firm to produce the industry's entire output. The telephone system is an example.^D Natural competitive forces also are restrained sometimes by the government, either directly (for example, through legal entry restrictions) or indirectly (for example, by protective tariffs). Some people argue that such government support is the major cause of noncompetitive behavior in the United States.^E

^D It may be desirable to regulate such monopolies. However, Posner, "The Social Costs of Monopoly and Regulation," presents evidence suggesting that the costs of regulation exceed the benefits.

^E See Milton Friedman, *Capitalism and Freedom* (Chicago: University of Chicago Press, 1962), pp. 125-132.

excess profits down to zero. These new firms, of course, will use the same polluting techniques as the original firm, for otherwise their costs would be higher and they would not be able to compete. Thus, the paper mill business will settle down to a state in which all mills pollute but in which there is no excess profit.

Again, the resulting situation is undesirable—not because there is excess profit, but because there is too much pollution. The appropriate social response is to institute tax or regulatory policies to reduce pollution by making it costly for firms to pollute. For example, society could require the paper mill to compensate the local residents, perhaps through an emission tax on the mill's malodorous output. Such a tax forces the mill to "internalize" the cost associated with bad odors by making the mill either pay a tax for continuing its emissions or install equipment to reduce the odors. In either case the mill will face higher costs of production and will respond by reducing output and raising the price of the paper, just as it would if any other production cost were to rise. This response is economically efficient; the buyers of the mill's paper ultimately pay *all* the costs of paper production, including the cost associated with the by-product odor.

Many external costs of firms are more consequential than the foul odors of a paper mill. Some kinds of air pollution are injurious to health, for example.¹² But all cases of external

costs are essentially like the paper mill example and can be treated by similar policies. As with fraud, the existence of external costs usually does not lead to excess profits (with the possible exception of noncompetitive enterprise). Again, the appropriate policies to combat these kinds of social problems do not involve attacking *profit itself* but only certain means of acquiring profit.

Exploitation and Income Distribution. It is sometimes said that businessmen earn much of their profit by exploiting their employees. The most extreme version of this position is that of Karl Marx and Friedrich Engels, who asserted that *all* profit resulted from exploitation of the workers. How well does this view fit the American economy?

If the buyers of labor services—the employers—are competitive with one another, there will be virtually no exploitation of labor. Rather, workers will be paid what they are economically worth, which means they will be paid according to their ability to produce. If an employer tried to exploit his workers by paying them less, other employers would bid the workers away by offering them higher wages. The original employer would be forced to match the higher wages or go out of business for lack of labor. Thus, in such a labor market, there can be no exploitation and therefore no excess profit from exploitation. The crucial question, then, is whether buyers of labor services in the American labor market

¹²For an attempt at measuring the mortal consequences, see Lester B. Lave and Eugene P. Seskin, "An

Analysis of the Association between U. S. Mortality and Air Pollution," *Journal of the American Statistical Association* 68 (1973): 284-90.

are competitive with each other. Apparently they are, to a very high degree.

In determining whether an industry is non-competitive, economists often use a measure called the four-firm concentration ratio. This is simply the percentage of the industry's output sold by the four largest firms in the industry. The usual rule of thumb is that when four or fewer firms control 50 percent or more of the industry's output, the industry is considered noncompetitive.¹³ It seems reasonable to apply a similar test to the American labor market. A fairly recent study has done just that by examining a large number of local labor markets and determining how many employers accounted for 50 percent or more of the employment within those markets. It was found that in only about five percent of the local labor markets surveyed were four or fewer firms hiring 50 percent or more of the labor. In addition, only about two percent of the labor force covered by the survey was in these noncompetitive areas.¹⁴ These are strikingly small percentages. If they are representative of the entire American labor market, they strongly suggest that exploitation of labor is an insignificant problem in the United States.

Despite this evidence, many people still feel some antipathy toward profit. Why? Perhaps Paul Samuelson has said it best: "Much of the hostility toward profit is really hostility toward the extremes of inequality in the distribution of money income . . ." The problem, then, is the equity issue of unequal incomes, or more fundamentally, that certain people are unable to earn incomes society deems adequate. The undeniable fact is that some people are born with mental, physical, or social handicaps and, through no fault of their own, do not have the same chance in life

as most people. And while these people live in poverty, others live in luxury.

What is to be done? This is a difficult question, but in seeking the answer, it is important to remember that in most cases economic exploitation in contemporary labor markets is not the cause of the unequal income distribution. In a competitive labor market, those who earn low wages do so because they do not work in fields society values most. Some lack the skills to do so, and others may prefer not to work in such fields. It is economically efficient that employers be allowed to pay them a competitive wage, even if it is low. If firms are forced to pay higher than competitive wages, economic logic dictates that they will hire fewer workers and produce less.¹⁵

A preferable solution, when labor markets are as competitive as in the United States, is to let the market determine wage rates and employment patterns and then for government to *supplement* the incomes of those earning too little on their own. The debate over the best way to carry out such public assistance has not been settled. Many programs have been tried, and there is now interest in reforming the welfare system.

However, whatever redistribution scheme is adopted, it is important that profit not be viewed as inherently different from other forms of income. To make profit a scapegoat for the unequal distribution of income and to tax it especially heavily would be an ironic mistake indeed. Such treatment of profit undoubtedly would hinder one of the most important forces for alleviating poverty and reducing income inequality—economic growth.¹⁶

¹³The four-firm concentration ratio is by no means infallible and is often supplemented by other considerations. See Nutter, *Extent of Enterprise Monopoly*, pp. 1-10, and Scherer, *Industrial Market Structure*, Chap. 2.

¹⁴See Robert L. Bunting, *Employer Concentration in Local Labor Markets* (Chapel Hill: University of North Carolina Press, 1962).

¹⁵The minimum wage, for example, gives some people a higher wage but leads to fewer people being hired in the first place. Thus, the goods that the unemployed would have produced are lost. The precise magnitude of the employment reduction is difficult to measure, but the existence of the effect has been confirmed by several studies. See Robert S. Goldfarb, "Quantitative Research on the Minimum Wage," *Monthly Labor Review* 98, No. 4 (April 1975): 44-46, and the articles discussed there.

¹⁶See Samuelson, *Economics*, Chap. 6, and also Morton

THE BOTTOM LINE

There are three important instances when profit seeking produces an undesirable outcome for society—when business is noncompetitive, when the cost of acquiring information about products and producers is high, and when business does not bear the full costs of production. The first allows some firms to earn excess profits, the second opens the door to cheating and fraud, and the third produces such social ills as pollution. All of these problems can be combatted by making

Paglin, "The Measurement and Trend of Inequality: A Basic Revision," *American Economic Review* 65 (1975): 598-609.

undesirable behavior costly through antitrust laws, fraud legislation, emission taxes, and the like. Such policies help reduce the occurrence of undesirable outcomes while retaining profit as a useful tool for organizing economic activity.

Profit is not only the concern of those in executive suites, for it affects all of society. It is an inducement to the business world to innovate, bear risk, and perform efficiently. It also is a means of allowing consumers to signal which goods they want and in what amounts while simultaneously rewarding producers for complying with their demands. Certainly the profit tool has some defects, but it seems far more desirable to repair the defects than to discard the tool.

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