Articles

# U.S. Competitiveness: Beyond the Trade Deficit

GEORGE N. HATSOPOULOS, PAUL R. KRUGMAN, LAWRENCE H. SUMMERS

**Large trade deficits and the corresponding increase in U.S. international indebtedness have raised concerns about the long-run competitiveness of the United States. But being competitive requires more than balance in our foreign trade; it requires an improving standard of living. The long-term U.S. competitive problem is largely caused by low saving rates, high costs of capital, and the resulting inadequate level of both visible and invisible investment. As long as the U.S. national saving rate remains far below that of all our major competitor nations, there is little chance for restoring America's international economic position.**

THE EXTRAORDINARY RISE IN THE U.S. TRADE DEFICIT from 1981 to 1987 and the corresponding rapid shift of the United States from the world's largest creditor to its largest debtor have focused national attention on the problem of U.S. competitiveness. Although public alarm over the trade deficit has served the useful function of bringing the problem into focus, it has also distorted the debate: the U.S. trade deficit is only a symptom of America's lagging competitiveness. The trade deficit represents, in essence, a U.S. economy that has been living beyond its means; bringing our spending into line with our income will be difficult, but the really serious problem is how slowly our income has been growing.

Does it matter if the United States is competitive? Unless the United States is able to turn its performance around, the future looks bleak. At best, the United States will experience a period of declining growth in living standards as the trade deficit is brought down, followed by a long period of slowly rising living standards associated with a steady relative decline of the United States in the world, comparable to that of Britain in the 20th century. At worst, the mismatch between our aspirations and our achievement could bring financial crisis on the Latin American model.

Warnings about U.S. competitiveness are now being widely sounded. We argue that these warnings do not put the emphasis where it belongs. Much of the explanation of the long-term U.S. competitive problem rests with low saving, a high cost of capital, and the resulting inadequate level of investment in both visible and intangible capital. As long as the U.S. national saving rate remains far below that of all our major competitor nations, there is little chance for restoring America's international economic position.

In this article, we examine the long-term problem of U.S. competitiveness. What it is, why it has emerged, and what we can do about it. First, we characterize the U.S. competitiveness problem and present evidence on its extent. Second, we analyze the roots of that problem. Third, we turn briefly to the relatively short-run issues of the U.S. trade deficit and the problems that the United States is likely to encounter in bringing it down. Finally, we offer some prescriptions for dealing with the U.S. competitive problem.

G. N. Hatsopoulos is chairman of the board and president of Thermo Electron Corporation, Waltham, MA 02254. P. R. Krugman is professor of economics at the Massachusetts Institute of Technology, Cambridge, MA 02139. L. H. Summers is professor of economics at Harvard University, Cambridge, MA 02138.

## What Do We Mean by Competitiveness?

There is a strong temptation to identify the issue of competitiveness with the single measure of the trade balance. However, while trade balances sometimes indicate competitive strength, they do not always do so. For example, from 1980 through 1986 Bolivia consistently ran a trade surplus. Exports exceeded imports by more than 60% in most years, and the trade surplus as a percentage of gross national product was usually larger than that of Japan. Yet nobody would consider this a demonstration of Bolivia's competitive strength—from 1980 to 1986 the per capita output of the already desperately poor Bolivian economy fell by 26%. What was happening, of course, was that Bolivia was forced to run large trade surpluses in order to service the large debts it had incurred in earlier years. Meanwhile, the real productive capacity of the economy was declining, in part because of the burden posed by the need to run large short-run trade surpluses. (This experience, although extreme, is not without relevance to the prospect that the United States now faces.)

The proper test of competitiveness, then, is not simply the ability of a country to balance its trade, but its ability to do so while achieving an acceptable rate of improvement in its standard of living. Neither rising living standards nor balanced trade are themselves enough to make a country competitive, since rising living standards can be achieved through growing trade deficits (as in the United States since 1981), whereas trade can be balanced through a steady decline in a country's relative standard of living (as in Britain since World War II and, perhaps, the United States in the 1990s). What is an acceptable rate of improvement in living standards? An advanced country like the United States, which possesses many natural advantages, should be able to maintain a living standard at least as high as that of other advanced countries; thus, we would not view the United States as competitive unless it is able in the long run to maintain a rate of growth in living standards that keeps pace with that of the rest of the industrial world.

## The U.S. Standard of Living

The United States retains the highest standard of living of major nations. However, our success in raising that standard of living for the past 15 years has been disappointing in comparison with our own past achievements, the experience of other countries, and our own potential.

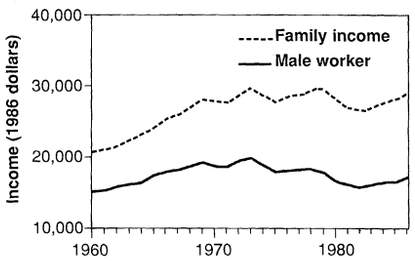


**Fig. 1.** Median adult male worker income and median family income (*17*).

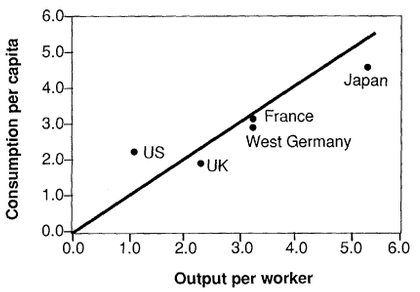


**Fig. 2.** Consumption per capita as a function of output per worker (average annual percentage growth rates, 1962–1985) (*18*).

Figure 1 shows median family income (*1*) along with the real earnings of the median full-time adult male worker in the United States in constant dollars since 1960. Like any simple measures, these are imperfect guides to how well we are doing; nonetheless, the picture is a striking one. Real family income peaked in 1973, and has failed to resume sustained growth despite the economic recovery since 1982. It is no exaggeration to speak of the United States in the past 15 years as passing through a "quiet depression" in which the income of families has stagnated or declined, forming a sharp contrast with the rapid growth in income that characterized the postwar years up to the early 1970s. Movements in median family income are affected by demographic changes—the trends toward more single parent families tend to reduce it, increased female labor force participation tends to increase it. However, the alternative measure provided by the incomes of full-time adult male workers has also stopped growing in recent years, confirming the fact of stagnation.

This stagnation of U.S. income need not, of course, represent a competitive problem. One could imagine a world in which shortages of raw materials or a slowing of technological progress led to stagnation of income everywhere. However, comparison with other countries makes it hard to blame the problem on such external factors: The stagnation in U.S. income has been accompanied by a steady erosion of the U.S. lead in income compared with other nations, as real income continues to rise elsewhere.

## Productivity Is the Fundamental Problem

The main source of the stagnation of real income in the United States has been inadequate growth in production. U.S. overall economic growth has been slower since 1973 than it was in the 1950s and 1960s: 2.2% annually from 1973 to 1985, compared with a 3.8% annual rate of growth from 1960 to 1973. Equally important, this growth has been achieved primarily through increases in employment rather than increases in productivity. With the growth in the labor force, due to the maturing of the baby boom generation and the movement of women into the labor force, the United States has been able to expand its work force rapidly (and it is an important achievement that these jobs have been made available), but the output of each worker has grown hardly at all. Output per worker rose at an annual rate of 1.9% per year during the period 1960 to 1973; it rose at an annual rate of only 0.3% per year from 1973 to 1985.

Over the long term, productivity growth is always the main determinant of trends in living standards. Figure 2 shows rates of growth of productivity and rates of growth in real consumption per capita for the period 1960 to 1985 for the major industrial countries. Clearly the results lie very close to a 45-degree line—that is, the rate of growth of consumption is nearly equal to that of productivity.

The extent to which U.S. productivity growth, broadly defined, has lagged behind that of other advanced countries may be most sharply seen by focusing on one fact: the wages that U.S. firms have been able to pay their workers have steadily lagged behind those that their foreign competitors can pay. U.S. workers have been able to compete in international markets only by steadily cutting their wages. Because labor income is most of national income, lagging wages are central to the relative decline in the U.S. position.

Let us briefly focus our attention on the manufacturing sector for which international comparisons are most easily made. Figure 3 shows how U.S. wages in manufacturing have fallen compared with those in Japan (converted into dollars at the going foreign exchange rate) since 1970. In 1970 our wages were 4.5 times those of Japan; through a combination of lower wage growth and repeated devaluations of the dollar the ratio had fallen to 1.1 in October 1987. (This comparison reflects an exchange rate of 140 yen per dollar; when the yen rises above 120, Japanese wages will overtake those in the United States.)

If the United States had maintained its one-time advantage over Japan in productivity, technology, and product quality, the fall in U.S. relative wages would have given U.S. manufacturers a huge advantage over their Japanese rivals. Obviously, this did not happen. Instead, the U.S. relative wage decline was matched by a decline in the ability of U.S. firms to compete in world markets, leaving the United States with a far bigger trade deficit in 1987 than in 1970. To put it another way, the decline in U.S. relative wages was necessary to compensate for a loss of other U.S. advantages.

Table 1 shows rates of growth of wages, expressed in U.S. dollars, and productivity in manufacturing for major industrial countries. We note that U.S. wages rose 7.1% more slowly than Japanese wages from 1970 to 1986, yet the United States moved into a deep trade deficit and Japan into a huge surplus during this period. The clear implication is that the U.S. relative wages needed to fall at least this rapidly in order to allow U.S. producers to sell their goods on world markets. The dotted line in Fig. 3 shows the "warranted" wage suggested by this observation: it shows a trend line that declines 7% a year (and that is assumed to reach 100, that is, equality of wage rates, in 1986). In periods when the U.S. relative wage has been close to this trend line, as during most of the 1970s, the United States has also been able to export roughly as much as it imports; in the 1980s, as the actual wage diverged from the warranted level, the United States moved into massive deficit. With the falling dollar, the U.S. relative wage has declined sharply, and over time we should begin to see the trade deficit shrink. Yet the long-run problem of competitiveness is not measured by the trade deficit but by the need for an ever-declining relative wage, and this shows no signs of reversing.

The necessity for lower wage growth in the United States compared with other advanced countries is a result of lagging U.S. productivity in the broadest sense—that is, both a lower rate of growth in physical output per worker and a declining advantage in technology and quality.

Official measures of productivity, which are difficult to adjust fully for changes in quality and technology, do not fully show the extent of U.S. relative decline. As Table 1 shows, the decline in U.S.

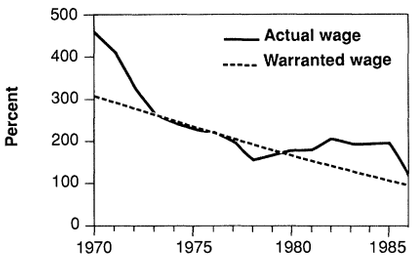


**Fig. 3.** Wages in manufacturing: United States wages as a percentage of Japanese wages (*19*).

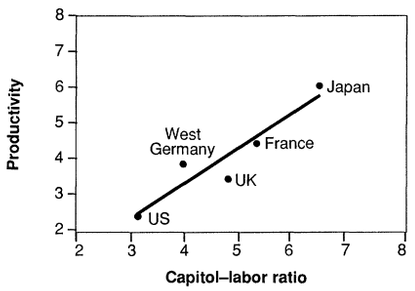


**Fig. 4.** Productivity as a function of the capital-labor ratio in manufacturing (average annual percentage growth rates, 1970–1985) (*18, 19*).

**Table 1.** Productivity and wage growth in manufacturing 1970 to 1986 (*19*).

| Measure | Average annual growth rates (%) | | | | |
|---|---|---|---|---|---|
| | U.S. | U.K. | France | Germany | Japan |
| Productivity growth | 2.9 | 3.4 | 4.2 | 3.8 | 6.0 |
| Difference from U.S. | | 0.5 | 1.3 | 0.9 | 3.1 |
| Wage growth in dollars | 7.2 | 10.5 | 11.3 | 11.2 | 14.3 |
| Difference from U.S. | | 3.3 | 4.1 | 4.0 | 7.1 |

relative wages has been more rapid than the relative decline in measured productivity. For example, Japanese manufacturing productivity has grown 3.1 percentage points faster than that in the United States since 1970. If that were the whole story, the United States could have held its own as long as its wages grew only 3.1% more slowly than Japan's. Yet in fact U.S. wages grew 7.1 percentage points more slowly than the Japanese, even though the United States was moving into a massive deficit in manufacturing trade and Japan into a massive surplus. The clear implication is that the United States needed to cut its wages by an additional 4 to 5 percentage points per year over and above the decline necessitated by slower measured productivity growth.

This is not surprising. Measured productivity growth rates do not fully take account of the decline in U.S. technological advantage. At the end of the 1960s, the United States had an overwhelming advantage over other countries in both innovation and the ability to convert ideas into useful products. As a result, in any given year the United States had a virtual monopoly in many products that had just recently been developed and that other countries could not yet make. The United States could afford to pay wages that made it uncompetitive in many goods because it could export goods that nobody else could supply. Over time this advantage has steadily eroded, as other countries—Europe as well as Japan—have challenged U.S. technological leadership. Today the product cycle is as likely to begin with Japan's introduction of a new product, emulated only later by U.S. firms, as the other way around. Since the United States no longer has a monopoly of the new, it needs labor cheap enough to let it compete on the old.

Another factor that is probably inadequately accounted for by conventional productivity measures is the perception of quality. Although no simple way exists of measuring this, it is clear that many purchasers of manufactured goods, both consumers and businesses, are willing to pay a premium for Japanese or European goods, where once they would have preferred those made in the United States.

Clearly both technology and quality are closely related to productivity. In fact, ideally both would be included in a definition of productivity. The key point is that the combination of a measured productivity lag, an eroding technological edge, and a perceived decline in relative quality have all contributed to the fact that the United States finds itself with a growing trade deficit unless it steadily reduces its relative wage rate at a very rapid rate. Indeed, the available evidence suggests that in order to remain competitive, wages in the United States will have to decline by a factor of about one-half relative to Japan each decade if current productivity trends continue.

## Why Is U.S. Productivity Growth So Slow?

*Capital formation and economic growth.* Although many explanations have been offered for lagging U.S. productivity and trade performance, one key factor stands out on even the most preliminary examination of the data. This is the relation between productivity growth and capital formation.

"Capital" is a broad concept. Fixed capital—plant and equipment—is only part of the total capital employed in business. Businesses must undertake a variety of activities that cut into current cash flow if they are to improve their situation in the future. Some of these activities, such as buying plant and equipment, are acknowledged by accounting practice as investments and, therefore, do not reduce reported profits. Other equally important activities, however, are not counted in this way. These activities create a stock of "invisible" capital that is potentially as important as the physical stock, yet they are expensed rather than capitalized.

The most obvious kind of invisible investment is research and development expenditure. We estimate that in 1985 U.S. manufacturers spent over 75% as much in nondefense R&D as they did in fixed assets. In addition, there are more subtle kinds of invisible investment. For example, if a firm accepts low earnings temporarily in order to move down a learning curve on a new product or establish itself in a new market, its accounts will show that the value of its earnings is low during the initial period. Fundamentally, there is no difference between investing by buying a new piece of equipment and investing by accepting initial losses to break into a market. Statistics on investment, however, count only the first but ignore the second.

A proper definition of capital should include, in addition to plant and equipment, investments in such activities as knowledge acquired through R&D, skills acquired through the willingness of firms to take losses while learning through experience, the creation of marketing and distribution networks, and so on. In what follows, we focus on what is most easily measured, realizing that this is a proxy for a much broader range of assets.

Figure 4 compares the rates of growth between 1970 and 1985 of manufacturing productivity with the rates of increase in the quantity of physical capital per worker for five major industrial countries. The relation is strikingly close and also is essentially proportional, as indicated by the closeness of the scatter of points to a 45-degree line. The United States is, of course, the low performer in both productivity growth and capital accumulation.

It might be objected that the causality could be running the other way—that countries with high rates of productivity growth for other reasons are able to raise their capital-labor ratios over time. To

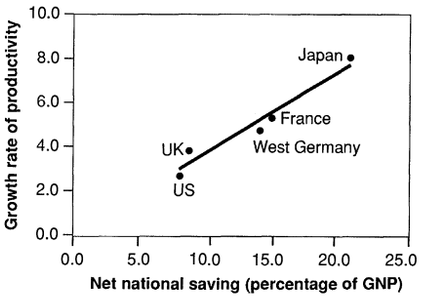


**Fig. 5.** Manufacturing productivity growth as a function of net national saving (average annual percent, 1962–1985) (*18, 19*).

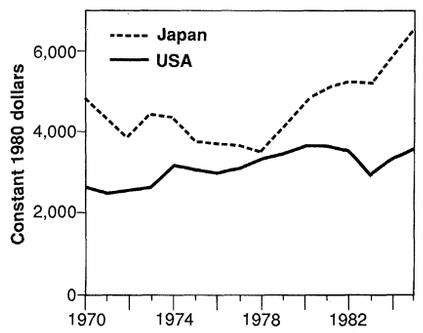


**Fig. 6.** Gross fixed investment per worker in manufacturing (*18*). Japanese data have been converted to U.S. dollars at the 1980 exchange rate of 220 yen per dollar.

check on this point, we plot in Fig. 5 productivity growth as a function of the rate of national savings as a fraction of income, which should not be strongly affected by the rate of economic growth (*2*). (Savings rates are, as we explain below, one of the main determinants of the rate of capital accumulation in the long run.) The relation remains very strong, suggesting that the causation does indeed run from capital to growth, not the other way around.

The strength of the relation between capital and growth is so great that it actually poses a problem for economic theory. Traditionally, economists have approached the role of capital in contributing to economic growth using the technique of growth accounting developed by Solow (*3*). Solow's approach involves estimating capital's contribution to economic growth by evaluating the share of capital income in total income. Essentially, his calculation involved asserting that a 1% increase in both the amount of labor and the amount of capital employed in production would raise output by 1%. Because capital's share in total income was about one-quarter, Solow's methods led him to conclude that the elasticity of output with respect to the capital stock was about one-quarter. That is Solow's conclusion; that of an extensive subsequent literature (*4*) was that a 1% increase in the capital labor ratio would raise output by much less than 1%.

If valid, this conclusion conflicts with the apparent strength of the relation between capital and growth as indicated in Fig. 4 and 5. For example, a Solow-type calculation implies that much of the difference in productivity growth rates between the United States and Japan cannot be attributed to differences in capital accumulation. As we have seen, the capital-labor ratio in Japan has increased at about 6.4% per year during the period 1970 to 1985, compared with 3.3% per year in the United States during the same period. This allows us to attribute to Japan's higher rate of capital investment only about 0.8 percentage points per year of the 3.2 percentage points per year difference in Japanese and U.S. growth rates.

The strong relation, however, between capital formation and growth is a clear fact of the data, and not an artifact of the countries we have selected. Romer (*5*) finds a strong statistical relation between investment rates and growth rates using a sample of 115 countries.

There are substantial theoretical and empirical reasons for thinking that conventional growth accounting calculations understate the role of capital formation in accounting for productivity growth.

First, capital investment embodies technical change. Countries where the rate of investment is high are likely also to have more modern capital stocks. A good example is provided by the Japanese and U.S. steel industries. During the past 20 years Japanese steel producers have been investing heavily in the basic oxygen and continuous casting processes whereas their U.S. counterparts, constrained by limited capital resources, invested in repairing their outdated equipment. Since many innovations are embodied in capital goods, innovation is more likely to occur in industries and nations where the rate of investment is high. Schmookler (*6*) found clear evidence that rates of patenting in different industries were closely tied to rates of investment.

Second, the traditional approach to estimating the contribution of capital to economic growth presumes that the total social return to capital is equal to its private return as reflected in the rate of profit. Increased production and installation of capital goods may generate learning-by-doing effects of the type stressed by Arrow (*7*), as costs of production fall with production experience. In this case, the social return to investment will exceed its private return. Alternatively, if labor is able to extract more than its marginal product, the social return to investment will be underestimated by the rate of profit.

In any case, investment in fixed capital is only part of the story, since capital, as we have already emphasized, contains a large invisible component as well as the visible stock of buildings and machines. The key point is that both visible and invisible investment are strongly influenced by a common factor—the cost of capital to firms.

*Fixed capital formation and the cost of capital.* The higher growth rate of the Japanese capital-labor ratio is, of course, the result of higher capital spending per employee. Figure 6 shows the gross fixed investment per employee in U.S. and Japanese manufacturing. On average, Japan has been investing 50% more per employee than the United States. Recently the disparity has increased to 100%.

The ratio of capital to labor that minimizes overall production costs for a firm depends on the relative costs of capital and labor. It follows that a major determinant of the rate at which capital is invested per employee is the cost of capital divided by the cost of labor. As mentioned previously, the cost of labor in Japan has been lower than in the United States and is presently about the same. Why then do the Japanese spend more on capital than we do? A good part of the answer is that their cost of capital is much lower than ours.

Several investigators (*8*) have studied the cost of capital in the United States and Japan. This is not a simple task because firms raise money both from borrowing and from equity (that is, retained earnings and new stock issues). This means that the cost of capital cannot simply be measured by the interest rate, the cost of borrowing. Normally, the cost of equity is much higher than the cost of debt, principally because interest payments are tax deductible to corporations whereas returns to equity holders are not. Moreover, investors generally demand higher returns on equity investments because they are more risky. On the other hand, corporations cannot rely solely on debt to finance investment because this would concentrate too much risk on their existing stockholders. Thus, two countries may have roughly equal real interest rates—as is currently the case for Japan and the United States—yet have very different costs of capital (*9*).

Despite the conceptual difficulties, reasonable estimates of the overall cost of capital can be made. Figure 7 shows the results obtained by Hatsopoulos and Brooks (*10*). It can be seen from this figure that Japanese manufacturers have generally enjoyed a cost of fixed capital before depreciation about one-third that of their

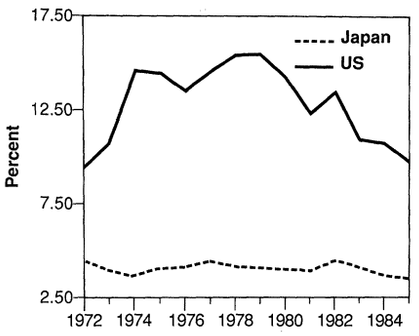


**Fig. 7.** Real cost of fixed assets in the United States and Japan (excluding depreciation) (*10*).

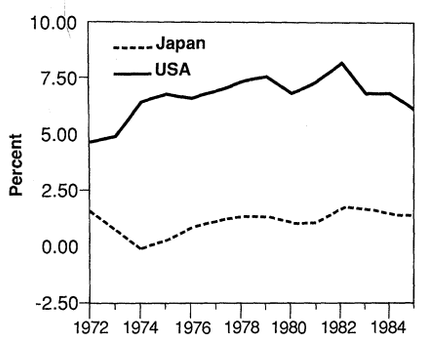


**Fig. 8.** Real after-tax cost of funds in the United States and Japan (*10*).

American counterparts. If one takes into account depreciation costs, which are common to both, U.S. costs are on average 50 to 75% higher than Japanese costs. Accordingly, capital spending in the United States and Japan appears roughly consistent with the cost of capital in the two countries.

*Invisible capital formation and the cost of capital.* It is fairly obvious that the extent of a firm's investment in physical assets will depend on its cost of capital. What is less widely appreciated is that investment in invisible assets—or even more generally, the planning horizon adopted by firms—also depends on the cost of capital.

Perhaps the most common indictment of American management holds that it is myopic. Critics charge that this myopia not only leads managers to forego profitable long-term investments in R&D, but also that it influences their behavior in other ways. For example, it is argued that U.S. firms are more reluctant than their foreign competitors to reduce prices and accept losses in order to penetrate markets and that U.S. firms forego investing in their work forces to the same extent as foreign competitors. Business myopia is blamed on a variety of factors ranging from the management techniques taught in business schools, to contemporary accounting rules, to the tyranny of a stock market driven by short-term traders.

We think that the critics are correct in emphasizing the difference in the planning horizons of U.S. and Japanese firms but suspect that they have misdiagnosed the problem. Suppose that managers systematically erred on the side of myopia. Then one would expect that there would have been strong incentives for those with longer horizons to displace myopic managers through hostile takeovers. In fact, hostile takeovers have been common in recent years. But almost invariably raiders have cited excessive investment as the reason for the takeover. Acquirers have been able to substantially increase corporate market values by scaling back investment and concentrating on increasing current profitability.

If anything, this suggests that U.S. managers are judged by the market to be operating with too long a horizon. The real question is, why does the market penalize U.S. managers for taking the long view? The answer is the high cost of funds.

The point is that the cost of funds plays a crucial role in determining how much a firm values future as opposed to current earnings. It determines how much patience on the part of a firm is actually rational. A decision that lowers earnings by $1 now while raising them by $2 10 years from now is a profitable decision if the firm's cost of funds is 5%, but it will lower the firm's value if the cost of funds is 10%. It follows that both visible and invisible investments will rationally be lower in a firm facing a high cost of funds than in one facing a low cost.

Estimates of the real cost of funds in the United States and Japan are shown in Fig. 8. (These numbers differ slightly from those in Fig. 7 because of the differing tax treatment of visible and invisible investment.) In 1985 the figure indicates that American firms had a real cost of funds of 6%; Japanese firms had a real cost of funds of only 1.5%. This means that a U.S. firm should be willing to undertake a project that lowers earnings by a dollar today and raises them by 1.2 constant dollars at some future date, only if the payoff comes in less than 3 years in the future. By contrast, a Japanese firm should be willing to sacrifice a dollar now for 1.2 dollars 12 years in the future. Thus, a U.S. firm would be irresponsible not to adopt a much shorter time horizon than its Japanese counterpart.

It is well known that Japanese manufacturers of automobiles and consumer electronics spent vast sums on distribution, service, and product promotion in order to penetrate the U.S. market. For example, in 1965 when Honda Motors, then a $400-million company, decided to develop automobiles for the U.S. market, its return on assets fell sharply—from a 9% average before that time to only a 3% average for the ensuing 15 years. By the mid-1980s, the investment had begun to pay off: Honda became a $20-billion company with an average return on assets of 8.5%. Clearly, there was a very long-term process of invisible investment taking place which is also very difficult to measure. The point, however, is straightforward: not only would a U.S. firm not have been willing to do what Honda did, but, more importantly, it should not have been willing to do so. Given the much higher U.S. cost of capital, an investment with such a long delayed payoff would not have been in the stockholders' interests.

If differences in the cost of capital persist for extended periods, their effects will run deeper than rational calculation. The type of people who rise to the top in a corporation and the culture of the firm evolve in response to what works best in its prevailing environment. Place a firm in an environment where the cost of capital is very low, and it will do best when it takes a long view, largely disregarding current profitability. In time, this long view becomes part of the company's way of doing business. Place a firm in an environment where the cost of capital is high, and the firm's interests will be best served by a short-term focus, and this too becomes part of the company's culture. These differences in approach may eventually come to seem cultural, and they will indeed be slow to change even if the cost of capital is altered. Nonetheless, the behavior of firms is ultimately conditioned by the cost of capital they face.

The short-term focus of American managers, then, is a rational response to their market situation. If anything, the evidence from takeovers and market valuations suggests that American managers take a longer view than is in the best interests of their stockholders. The appropriate strategy for lengthening business planning horizons and encouraging long-term investments is not to criticize corporate cultures but to change the market incentives that shape them.

We do not mean to deny that there are many ways in which U.S. management and the organization of U.S. industry could and should be improved that are independent of the cost of capital. However, it is important to emphasize the role of the macroeconomic environment, of which the cost of capital is a key feature, in our competitive performance. When analysts study competition in

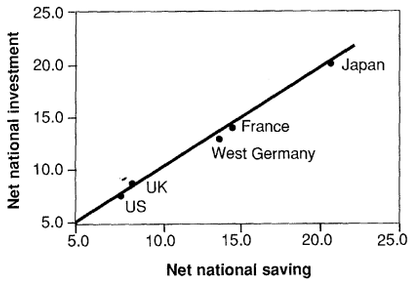


**Fig. 9.** Net national investment as a function of net national saving (average annual percentage of gross domestic product, 1962–1985) (*18*).

individual industries, as is the case in most studies of competitiveness, they naturally tend to focus on industry-specific sources of success or failure. Thus, it is important to stress that the unsatisfactory performance of U.S. industry across the board must have broader causes—and that a high cost of capital is a key problem that all U.S. industry faces.

There is a further reason for focusing on the cost of capital in addressing U.S. productivity problems. Many other possible sources of productivity difficulties are much less amenable to public policy. Insofar as the productivity problem is a consequence of the depletion of good ideas, as suggested by Nordhaus (*11*), or the changing attitudes of workers, or the behavior of managers, there is relatively little that public policy can do to address it. On the other hand, public policy can do a great deal to lower the cost of capital.

*Why does the United States invest so little?* The high cost of capital in the United States is the most important proximate cause of low investment rates, which, in turn, are the major explanation of lagging U.S. competitiveness. The cost of capital, however, is not a price that is arbitrarily set by fiat. Like other prices, it reflects supply and demand. Specifically, the high cost of capital to the U.S. manufacturing sector reflects the limited availability of funds to that sector. Our manufacturing sector finds access to capital limited both by an extremely low overall national savings rate and because the United States puts a large fraction of its savings into nonbusiness uses such as residential housing. Of course, the cost of capital is affected by tax, monetary, and fiscal policies. These policies influence the cost of capital by altering the supply and allocations of savings.

In the long run the ability of a country to invest is constrained by its willingness to save. International capital flows have not historically been large enough to allow major countries to finance more than a small fraction of their investment through foreign borrowing; the close relation between national savings rates and investment rates is shown in Fig. 9. In this respect, U.S. experience since 1982 represents an aberration. For several years the United States has had extremely low and declining national savings, but has been able to avoid the full consequences of this savings decline because massive inflows of foreign capital have financed most of our investment (Table 2).

For some time now, the U.S. national saving rate has been the lowest among the advanced industrial countries and has fallen recently to its lowest nondepression level in history. It is true that measured national savings fail to account for the invisible investments, which are just as important as visible ones. We offer the conjecture, however, that both the gap between the United States and other industrial countries and the decline in national saving in the 1980s would be even larger if we could measure invisible investments as well as tangible ones.

National saving may be divided into two components, that of the federal government and that of the rest of the economy. Both have been inadequate and declined in recent years (Table 3). There is no mystery regarding the decline in federal saving or more accurately, the increase in federal dissaving. It is a consequence of the imbalance between spending and taxation ever since the massive 1981 tax cut. Declining private saving is more mysterious. Summers and Carroll (*12*) reviewed a number of possible factors that may explain the low level of private saving and concluded that it is probably a consequence of a number of institutional factors in this country, including the easy availability of consumer credit, increasingly generous Social Security and pension benefits, and the spread of life and disability insurance. These explanations suggest that without major changes in public policy, it is unlikely that private saving will rebound strongly in coming years, let alone reach levels needed to make our industry competitive.

It is tempting to ascribe the low U.S. national saving rate entirely to cultural factors: a get-rich-quick society, the yuppie mentality, the frontier ethic. However, as in the case of understanding the sources of differences in productivity growth, it makes sense to focus on what can be measured—and changed—before blaming the whole problem on culture. What is clear is that the U.S. fiscal policies, the ways in which the government finances its expenditures, redistributes income among segments of the population, give strong disincentives to save and, conversely, strong incentives to consume now rather than later.

It is useful to bear in mind that Japan's extraordinarily high savings rate has not been a permanent feature of the culture. Before World War II Japanese savings rates were not out of line with those of the United States; it is only in the postwar period that the countries have followed divergent courses (*13*). Thus, it makes sense to focus on the ways in which U.S. institutions and government policy encourage current consumption at the expense of saving.

There are three major ways in which the U.S. government in effect subsidizes current consumption and taxes saving. These are: the recently rampant budget deficit, the effect of which is to subsidize the present at the expense of the future; the Social Security system, which subsidizes the consumption of present generations at the expense of future ones; and the income tax, both corporate and private, which biases consumption toward the present.

*The budget deficit.* The recent emergence of huge peacetime budget deficits is a new phenomenon, but it should be viewed in context as the latest in a series of government actions that have the effect of subsidizing current consumption at the expense of the future.

In 1986, dissaving by the federal government absorbed 90% of the private saving generated by households and corporations (al-

**Table 2.** Net national saving and net national investment in the United States and Japan as percentages of gross national product (*18, 20*). Japanese data are adjusted for accounting differences between OECD and the U.S. Department of Commerce.

| Year | Japan | | | United States | | |
|---|---|---|---|---|---|---|
| | National saving | National investment | Foreign investment | National saving | National investment | Foreign investment |
| 1966–1970 | 16.0 | 16.4 | 0.4 | 7.6 | 7.2 | 0.4 |
| 1971–1975 | 15.7 | 14.7 | 1.0 | 7.3 | 6.8 | 0.5 |
| 1976–1980 | 11.6 | 11.3 | 0.3 | 6.7 | 6.7 | 0.0 |
| 1981–1985 | 10.6 | 9.1 | 1.5 | 3.2 | 4.5 | −1.3 |

though this effect was slightly mitigated by a surplus on the part of state and local governments). Although the measured federal deficit fell by almost one-third between 1986 and 1987, this decline was largely a reflection of transitory factors relating to the Tax Reform Act and the sale of federal assets. As a consequence, official projections call for federal deficits approaching $200 billion in coming years if substantial policy changes are not enacted. There is every reason to expect that even these projections are too optimistic. Historical experience suggests that budget forecasts tend to underpredict actual deficits, and the current projections assume that the U.S. economy will for the first time in its history enjoy ten consecutive years of economic growth between 1982 and 1992.

Ever since the 1981 tax cut, the government has let taxes fall short of its spending without any credible promise that spending will fall in the future. This makes it inevitable that taxes will have to be raised, both to close the current gap and to service the national debt that has arisen. Since the part of government spending not covered by current tax revenues still represents resources diverted from other uses, the deficit does not make the private sector any richer. The deficit subsidizes the consumption of those now working at the expense of future generations. The benefits of taxes lower than spending accrue now and are spent on consumption. The costs of higher taxes later on when the debt must be serviced will be paid in part by future generations who cannot begin saving now. So, the result is a subsidy to current consumption that is paid by the future.

*Social Security*. The Social Security system is in outward form like a national pension fund. However, unlike private sector pension plans, Social Security has traditionally been unfunded—that is, it has not accumulated a base of assets out of which to meet its obligations. Instead, it relies on the current contributions of those now working to pay for the receipts of those who are retired.

This is not a small issue. If in the past, Social Security liabilities had been fully funded, as with private pension funds, Social Security would have accumulated a $5.5-trillion surplus by now compared with a total fixed capital stock in U.S. industry at $3.7 trillion (*14*).

The present Social Security law, enacted in 1983, calls for the accumulation of substantial surpluses in coming years so that large tax increases will not be necessary when the baby boom generation retires early in the next century. If these surpluses are accumulated and are not offset by deficits in the remainder of the federal budget, they will make a substantial contribution to increasing national saving.

*The income tax*. The impact of the income tax may be seen by comparing the rate of return that the economy earns on investment in the manufacturing sector with the return that an individual investing in that sector is likely to receive net of taxes. Suppose, not too unreasonably, that the rate of return in manufacturing is 10% in real terms—that is, that a dollar of output devoted to investment in plant and equipment will raise the output of a firm next year by 10%. Translated into compound interest, this means that a dollar's worth of consumption foregone today can be traded for two dollar's worth 7 years from now. If individuals were able to receive the rate of return that the U.S. economy as a whole gets from deferring consumption, many would voluntarily consume considerably less and save considerably more.

However, individuals do not get the 10% rate of return, because taxes drive a wedge between the economy's return and what individuals receive. First, the firm must pay taxes on profits. Although inflation has been greatly reduced, taxable corporate profits are still exaggerated by valuing investments at historical cost. At 4% inflation, a 10% real rate of return may appear from the point of view of the Internal Revenue Service as a 14% nominal rate, on which taxes of 34%—about 4.75 percentage points—will be levied. This leaves the firm with nominal after-tax profits of 9.25%, which it can pass on to its stockholders. The latter, in turn, must pay taxes—say about 30% or 2.75 percentage points. What is left, then, is a nominal return of 6.5%, or a real rate of return of only 2.5%—only a quarter of what their saving is worth to the economy.

**Table 3.** United States net national saving rates for selected years as a percentage of gross national product (*20*).

| Year | National saving | Federal government | Rest of economy |
|---|---|---|---|
| 1969–1970 | 7.6 | −0.6 | 8.2 |
| 1971–1975 | 7.3 | −1.8 | 9.1 |
| 1976–1980 | 6.7 | −1.9 | 8.6 |
| 1981–1985 | 3.2 | −4.2 | 7.5 |
| 1986 | 1.8 | −4.8 | 6.6 |
| 1987 | 1.9 | −3.4 | 5.3 |

To put it another way, from the point of view of the economy, deferring a dollar's worth of consumption allows it to substitute two dollar's worth after only 7 years. From the point of view of individuals, however, they can only trade a dollar today for two dollars 30 years from now. This massive distortion of incentives surely plays an important role in explaining the remarkably low U.S. savings rate.

In addition to reducing savings, the income tax encourages diversion of an excessive fraction of these savings into residential housing. The key point here is that the services provided by an owner-occupied house—although they represent a return on an investment, in the same way as interest on a bond—are not counted as income and therefore not taxed.

We should finally note that during the high inflation years of the late 1970s these incentives were even worse than they are now. For an extended period the real after-tax rates of return facing U.S. households were substantially negative: a dollar spent now purchased more than that dollar saved for the future (unless that dollar was used to buy a house). Consumption behavior, like the behavior of firms, gradually adapts to its environment. The low savings that now appear to be a part of U.S. culture may well be the delayed response to the extreme disincentives to saving created in the 1970s.

The disincentives to saving provided by the U.S. tax system are not inevitable. They are not the unavoidable price of the welfare state or our defense burden. Better alternatives exist that would raise the same revenue. For example, a tax on consumption rather than income would avoid the bias toward consuming now rather than later that is so strong in our current system (*15*). Despite major political action on taxes in the 1980s, we have not made progress toward a system that would provide more incentives to save. The 1980s have been marked by major changes in U.S. tax policy: first the major tax cuts of 1981, then the tax reform of 1986. One might have expected that these changes would have helped correct the problems we have pointed to earlier. They have not. Although a detailed discussion of the implications of recent tax changes is beyond the scope of this article, a careful analysis shows that the overall "wedge"—the difference between the return on investment from the point of view of society and from the point of view of an individual deciding whether to consume or save—has if anything gotten wider since 1980 (*16*). Meanwhile, the massive federal deficit and the decline in private savings have cut sharply into the overall savings pool.

*How much sacrifice is needed?* Fifteen years ago, the United States had an advantage in technology, resources, and the size of its internal market that allowed it to be the richest and most productive nation in the world, despite having what was even then an unusually low rate of national savings. This is no longer possible. With rough technological parity between the United States and other advanced

nations, we cannot expect to compete with other countries unless we save and invest as much as they do.

The magnitude of the change this will require should be apparent from the preceding discussion. The United States is currently saving only 2% of its national income. Thus, even to return to a historically normal saving rate of 5 to 6% will require more than a doubling of our current savings rate. Yet this is not nearly enough to make the United States competitive. We must expect that we will need to save as much as other advanced countries. Even if we do not try to match Japan, with its extraordinary saving rate, the average saving rate of advanced countries other than the United States is 11%. There is no reason to believe that the United States can remain a first-rate economy unless it comes close to matching the average saving rate of our competitors.

To achieve such a high savings rate (even though this is a perfectly normal rate elsewhere in the world) will, as our discussion has suggested, require major adjustments. We will need, first of all, to eliminate our federal budget deficit—something that is still not being discussed realistically in the political arena. We will also need to make major reforms of long-standing institutions, notably our tax system. All this will be extremely difficult.

What will make it even more difficult is the fact that in the last few years, instead of moving in the direction of increasing savings, the United States has moved in the opposite direction. It treated itself to an unearned consumption boom largely financed by foreign borrowing.

From 1979 to 1986 U.S. net national product per worker, in constant dollars, rose only 2.2%, with slow productivity growth and declining income from our diminishing net investments overseas. In other words, the consumption the United States could afford increased at a snail's pace. Yet, actual U.S. consumption per worker rose 8.8%. People were in fact living substantially better in 1986 than in 1979.

This rise in consumption was possible for two reasons. The main one was the growth of the trade deficit, which allowed the United States to spend more than it earned. A significant extra reason was that U.S. net investment failed to keep pace with the economy's growth: net private investment per worker was actually 16% lower in 1986 than it was in 1979. Both reasons for rising consumption, of course, share a common aspect: they are ways in which current consumption was increased at the expense of the future.

The extent to which consumption growth has outstripped production growth during the past 7 years means that now the reverse must happen. A minimum estimate of the belt-tightening ahead is the difference between consumption and production growth since 1979, that is, more than 6%. Even the savings rates of the late 1970s, however, were much lower than those of other industrial countries and, in our view, clearly inadequate to restore U.S. long-term competitiveness. So the trimming down of consumption relative to production that the United States must now undertake could be large, quite easily as large as 10%.

## Getting from Here to There: The Trade Deficit

So far we have left aside the whole question of the U.S. trade deficit. Important as it is, we think that it is a mistake to use the trade deficit as a measure of the U.S. competitive problem. It is a symptom of the problem, but a symptom that has only appeared recently and that will inevitably prove temporary. By contrast, the underlying competitive problem has been growing steadily for a long time and will still be with us when the trade deficit is gone.

The trade deficit is commonly viewed in isolation, as a special problem in an otherwise prosperous economy in which employment and real consumption per worker have been rising. At first glance it might seem that everything has been fine except for the trade deficit. In fact, this picture is backward. Everything has seemed fine because of the trade deficit, which has masked the underlying disappointing performance of the United States as a producing nation.

To understand this, we need to realize that on the whole running a trade deficit is a pleasant experience for a nation, until the bills come due. There are many useful angles from which to view the U.S. trade deficit, but the most fundamental is that it represents the excess of what the United States spends over what it earns. As long as a country can run up its trade deficit, it can raise its consumption without either raising its output or cutting its investment. It simply imports the resources needed to satisfy the increased consumption. And this is exactly what we have done since 1979.

In an important sense, then, the U.S. trade deficit represents a sort of fluke. We have experienced a decline in saving that should have severely squeezed our already inadequate investment. But we were able temporarily to avoid the consequences because we were able to attract a large inflow of foreign capital. This was in a sense a lucky accident—but it may not turn out to have been so lucky in the end. By cushioning the United States from the consequences of its savings collapse, the willingness of foreigners to finance our trade deficit has created a false sense that the situation is acceptable. The capital inflow cannot continue indefinitely and is already starting to dry up. When it does, the United States will find that in order to maintain even a barely adequate level of investment, let alone raise investment to levels comparable to that of other advanced countries, it will have to hold its rate of consumption growth well below its rate of growth in production.

The recognition of the need for a sharp slowdown in the growth of U.S. consumption has not yet been fully appreciated even by informed opinion. There is still a widespread belief that somehow an appropriate policy mix, especially with cooperation from foreign governments, can allow the United States to balance its trade without making any sacrifices. It is important to understand that this comfortable view is wrong. Concessions from foreign governments can somewhat reduce the size of the required U.S. adjustment, but the bulk of the belt-tightening is inevitable whatever the rest of the world does.

The essential point is that the United States must produce more exports, must do with fewer imports, and therefore produce more substitutes for imports, and must produce more capital goods. All three actions require commitment of resources of capital, labor, and raw materials. Since we do not have large unemployed resources, resources have to be diverted from producing goods for domestic consumers. Regardless of what the rest of the world does, we must slow the growth of our consumption.

## Conclusions

The United States still has great advantages that should ensure it as high a living standard as any other country—considerable natural resources, political stability, a unified internal market, and a highly flexible and innovative society. For 15 years, however, U.S. productivity and living standards have stagnated, due largely to a chronic unwillingness to make sufficient provision for the future. The consequences of that stagnation were masked in the 1980s by a consumption boom fueled by budget deficits and massive borrowing from abroad. But the twin deficits will be resolved one way or another in the next few years, and as they decline our standard of living will once again be constrained by our productivity.

The questions that will determine America's economic future are

these: Will we face reality and make the adjustments necessary to provide for rapid growth into the 21st century? Or will we instead continue to consume as much as possible for as long as possible without regard to the future?

It is politically attractive to deny that the dilemma exists. Concern over low productivity growth in the late 1970s led, not to a realistic response, but to economic policies based on wishful thinking. These policies boosted consumption without boosting production and have left the economy in worse shape than it was before. The current political debate is hardly encouraging—few candidates have the courage to speak plainly about the difficulties we face, and the voters have not encouraged those that do.

Nonetheless, we believe that ultimately America will face the challenge and regain the economic leadership of which it is still capable. It is encouraging to remember the experience of the energy crisis. In 1974 when that crisis first hit, many commentators believed that the national propensity to consume energy was immutable. In the face of a real crisis, however, the country responded: from 1973 to 1987 the United States proved able to increase gross national product by 38% in real terms with no increase in energy consumption at all. Not immediately, but eventually, the political system proved willing to do what was necessary by allowing energy prices to rise and by providing incentives to conserve. And there was a change in the national energy "ethic"—toward insulated homes, smaller cars, and more efficient factories—a change stimulated by public rhetoric and promoted by public policy.

The U.S. competitive problem, like its energy problem, must be resolved at many levels. In this article we have emphasized the need for a sharp rise in U.S. savings, which is the sine qua non of any effort to maintain U.S. relative standing in the world economy. Of course this increase is not a panacea; increased savings must be used well, which means that they should be accompanied by changes in tax policy, regulation, government research, and monetary policy that ensure an effective application of increased investable resources. The important point is to realize that any other policies cannot work unless the United States also restrains its consumption growth.

Although this will be difficult, the task is not impossible. We have already pointed out that Japan did not always have an extraordinarily high savings rate. The high savings rate emerged only in the recovery after World War II when the imperative of economic growth was clear to the Japanese government and to the Japanese public. The United States remains a fortunate nation, which will not need such an extraordinary turnaround; we should be able to meet our more modest challenge. If the rate of growth of U.S. consumption could be kept even 1% below the rate of growth of U.S. output from now until the year 2000—and the reduced consumption to be replaced by increased exports and investment—the U.S. would be strongly placed to regain the position of international economic leadership that its natural advantages should entitle it to. The energy crisis was in the end met with political realism and courage, but only after the failure of old policies was dramatized by shortages and gas lines. The challenge for policy toward U.S. savings, the key to competitiveness, is to act without the help of a similarly dramatic crisis.

## REFERENCES AND NOTES


1. The U.S. Congressional Budget Office (CBO) has released a report in which the official measures of family income is adjusted to account for changes in family size and certain technical problems with the Consumer Price Index ["Trends in Family Income: 1970–1986" (Congressional Budget Office, Washington, DC, February 1988)]. The adjusted family-income series shows more improvement during the 1970s and 1980s than the official series. However, the CBO series does not adjust for the increased number of workers per family and therefore fails to account for the increased work effort required to sustain improvements in family income.
2. In Fig. 5, national saving rates are compared with manufacturing-sector productivity. The relation between national saving rates and economy-wide productivity is similar to that shown in Fig. 5.
3. R. M. Solow, *Rev. Econ. Stat.* **39**, 312 (1957).
4. For a state-of-the-art use of growth accounting to analyze U.S. performance, see D. Jorgenson, F. Gollop, and B. Graument [*Productivity and U.S. Economic Growth* (Harvard Univ. Press, Cambridge, MA, 1987)].
5. P. M. Romer, *Macroecon. Annu.* **2**, 163 (1987).
6. J. Schmookler, *Invention and Economic Growth* (Harvard Univ. Press, Cambridge, MA, 1966).
7. K. J. Arrow, *Rev. Econ. Stud.* **29**, 155 (1962).
8. G. N. Hatsopoulos and S. H. Brooks, in *Technology and Economic Policy*, R. Landau and D. Jorgenson, Eds. (Ballinger, Cambridge, MA, 1986), pp. 221–280; G. N. Hatsopoulos, "High Cost of Capital: Handicap of American Industry," Thermo Electron Corporation, Waltham, MA, 26 April 1983; C. Y. Baldwin, in *Competition in Global Industries*, M. E. Porter, Ed. (Harvard Business School Press, Boston, 1986), pp. 185–223; B. D. Bernheim and J. B. Shoven, "Taxation and the cost of capital: An international comparison," paper presented at the American Council for Capital Formation Conference on "Consumption Tax: A Better Alternative?" Washington, DC, 3 September 1986; A. Ando and A. J. Auerbach. "The cost of capital in the United States and Japan: A comparison," paper presented at the Joint NBER–Ministry of Finance Conference on U.S. and Japanese Economics, Tokyo, Japan, 16 and 17 October 1986. For additional references to studies on the cost of capital, see Hatsopoulos and Brooks (*10*).
9. It is often argued that the opening of capital markets in Japan will tend to equalize costs of capital. This is not true. The cost of capital in Japan is lower than in the United States (despite similar real interest rates) because of two things: the tax system and the financial structure of Japanese industry. Equity investors in Japan are taxed much less than those in the United States because in Japan capital gains on equities are tax-free and dividends are partially deductible at the corporate level. Equalization of after-tax returns to investors will still produce very different costs of equity to the firm. Moreover, in Japan national risk sharing, through the interlocking ownership of industry and banks, allows for much higher debt-to-equity ratios without an increase in the risk premium on equities. Since debt is much cheaper than equity, a higher debt-to-equity ratio will lower the cost of capital in Japan.
10. G. N. Hatsopoulos and S. H. Brooks "The cost of capital in the United States and Japan," paper presented at the International Conference on the Cost of Capital, Kennedy School of Government, Harvard University, Cambridge, MA, 19 to 21 November 1987.
11. W. D. Nordhaus, *Europ. Econ. Rev.* **18**, 131 (1982).
12. L. H. Summers and C. Carroll, in *Brookings Papers on Economic Activity* (Brookings Institution, Washington, DC, 1987), vol. 2, p. 607. Crucial policy steps contained in the Tax Reduction Act of 1986 working to increase the cost of capital for business include the repeal of the investment tax credit in 1986, the deceleration of depreciation allowances, and the elimination of capital gains preferences. These steps primarily apply to new investment. On the other hand, the effective tax rate reductions primarily apply to old capital.
13. For the period from 1920 to 1939, the average net national saving in Japan was 5.2% of the gross national product, see K. Sato, in *The Political Economy of Japan: The Domestic Transformation*, K. Yamamura and Y. Yasuba, Eds. (Stanford Univ. Press, Stanford, CA, 1987), vol. 1, p. 137.
14. Office of the Secretary, Department of Treasury, as footnote to "Statement of liabilities and other financial commitments of the U.S. government as of September 30, 1987," *Treas. Bull.* (Winter issue, March 1988).
15. See D. Bradford, "The choice between income and consumption taxes," *New Directions in Federal Tax Policy for the 1980s* (Tax Notes, Tax Analysts, Arlington, VA, 1984), p. 224.
16. L. H. Summers *Harv. Bus. Rev.* **65**, 53 (1987).
17. U.S. Department of Commerce, Bureau of the Census, as reported in *The Economic Report of the President* (Government Printing Office, Washington, DC, February 1988), table B-30, p. 282.
18. Data from selected publication of the Organization for Economic Cooperation and Development (OECD), Paris, France (1987): National Accounts of OECD Countries, vol. 1; National Accounts of OECD Countries, vol. 2; Flows and Stocks of Fixed Capital; Labour Force Statistics.
19. "Output per Hour, Hourly Compensation, and Unit Labor Costs in Manufacturing, Twelve Countries, 1950–1986" (U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, Washington, DC, December 1987).
20. U.S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts, 1988.


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