

# The quality of capital investment in the United States

by Lydia Schulman



*U.S. machine tools: most are out of date.*

The acceleration of structural inflation in the U.S. economy has its root in the deterioration of U.S. capital formation. Since 1975 especially, U.S. capital investment has been stagnating quantitatively, and it has been deteriorating qualitatively.

As the following report will illustrate, this qualitative deterioration has been governed by a vicious irony: that new capital formation has been devoted increasingly to seeking ways to achieve energy "conservation" and substitute labor for energy and capital in production processes. The results of this shift in the composition of capital formation have been a leveling off of the rate of productivity growth over the last two years (measured as output per manhour) and galloping inflation.

The dominant character of U.S. capital investment is exemplified by the \$60 billion the big three auto companies plan to spend over the next five years to retool their plants to produce the smaller, more "fuel-efficient" cars mandated by the federal government. Putting aside for a moment the likelihood that these capital outlays will bankrupt two of the three automakers before the five years are up, it is readily apparent that the retooling program represents a misinvestment of \$60 billion to adapt to a fictitious "energy crisis" and to perpetuate an obsolescent mode of technology. Unfortunately, an increasing proportion of U.S. capital investment is of the same non-productive and wasteful character.

A useful area of capital investment for the automakers would be in the development of nonpolluting, hydrogen fuel-based automobiles and entire mass transportation systems. Such an investment program, of course, would have to take place in the context of a national commitment to developing cheaper, more efficient energy sources for the economy as a whole.

To fully appreciate the misinvestment represented by the planned auto retooling program, consider that \$60 billion invested in the construction of added U.S. nuclear energy capacity would save considerably more petroleum than the more fuel-efficient autos, leaving Americans to drive larger and safer cars and leaving the auto industry to put its investment funds to better use. \$60 billion invested in the development of thermonuclear fusion would most probably bring on line a power source much cheaper than anything else available by the end of the 1980s, solving America's and the world's energy problems for the foreseeable future. Rep. McCormack (D.-Wash.) recently proposed legislation that would provide \$20 billion for the start up of a demonstration fusion reactor. To save trivial amounts of petroleum, the auto companies plan to spend three times that amount.

### What the figures show

The accompanying graphs indicate the overall parameters of the quantitative and qualitative deterioration of U.S. capital formation. New expenditures on plant and equipment adjusted for inflation have been virtually stagnant over the last decade (Graph 1). At \$103 billion last year, constant dollar capital expenditures were barely higher than the \$97.5 billion level reached in 1974, before the quadrupling of world energy prices took its full toll on output and investment.

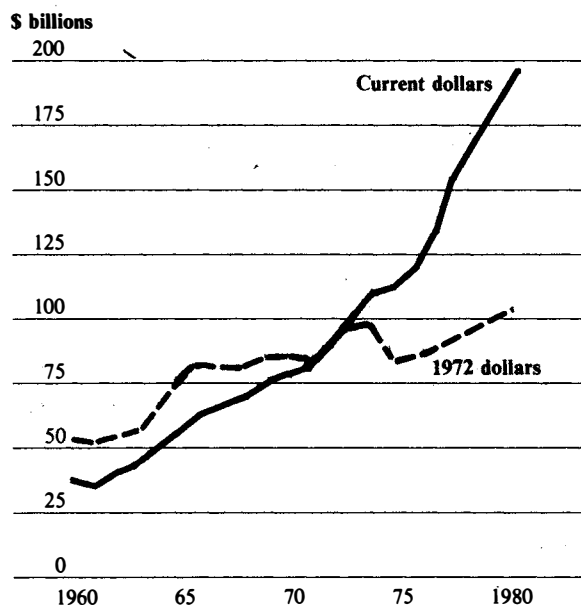
The annual survey conducted by the U.S. Commerce Department in late November and December of last year indicated that U.S. business plans to spend \$195.7 billion (current dollars) for new plant and equipment in 1980. Survey respondents also indicated that they expected capital goods prices to increase by 10 percent this year, implying a mere 1-2 percent increase in planned real spending on plant and equipment.

Graph 1 also records an exponential take off in capital goods prices beginning in about 1975, which was related to the energy-intensity of the capital goods industries and the over-strained capacity conditions in that economic sector. The higher-than-average rate of inflation of capital goods prices, together with an adverse tax environment and steadily worsening credit conditions, have now discouraged productive capital formation to the point of unleashing a self-feeding spiral of eroding real capital formation and accelerating structural inflation.

In Graph 2, two categories of plant and equipment expenditures—spending on pollution abatement and purchases of autos and trucks for business use—have been deducted from total inflation-adjusted capital spending to better approximate the real level of spending on productive plant and equipment.

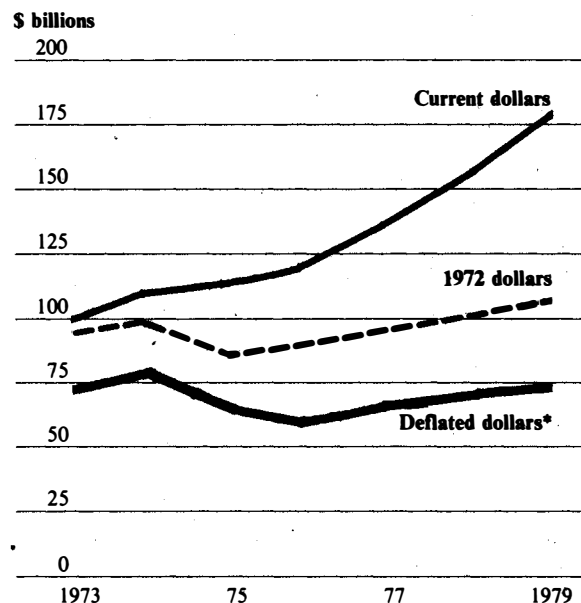
Compliance with Environmental Protection Agency

**Graph 1**  
Expenditures on new plant and equipment by U.S. business, 1960 to present



Source: U.S. Dept. of Commerce, Bureau of Economic Analysis

**Graph 2**  
Expenditures on new plant and equipment by U.S. business, 1973-1979



\* Less spending on pollution abatement equipment and trucks and cars for business use.

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis

and other government regulatory agency requirements accounts for a major chunk of nonproductive capital investment each year. Between 1974 and 1979, spending on scrubbers and other pollution abatement devices accounted for an average of 5.4 percent of total plant and equipment devices per year, and the amount of such spending is expected to rise sharply over the next five years, as new environmental regulations take force. The EPA itself is projecting that U.S. business will spend \$220 billion on pollution abatement over the next 10 years, or triple the current annual rate!

### **The example of machine tools**

Increased capital spending by the private sector related to the projected rise in government defense spending and to synthetic fuel production—two features of the Carter administration's Fiscal 1981 budget—represent the same sort of misinvestment and tilting of the composition of capital formation in favor of nonproductive

investment. The administration's synfuels program is an example of highly inflationary, pure waste spending, whose stated aim is to produce energy by the most costly procedures available.

A telling reflection of the shift in the internal composition of U.S. capital formation is seen in the shifting distribution of the stock of machine tools in the United States. The machine tool industry is properly regarded as one of the key "productivity-generating" centers in the economy. Leaps in growth of productivity are mediated through the absolute expansion of machine tool capacity and the technologically advancing character of that machine tool stock.

Over the last year, the shipments of the machine tool industry have been increasingly absorbed by retooling by automakers and airframe builders, who are racing to meet federal fuel-efficiency and air and noise pollution standards. According to one estimate, around 20 percent of new shipments are currently destined for the auto industry, where they will be used to turn out the new

## **U.S. capital investment in selected industries**

*Here is what the trend in capital investment looks like for selected industrial sectors.*

**Transportation equipment.** The Ford Motor Company has budgeted \$20 billion for "product spending" over the eight-year period from 1978 through 1985. Of this amount, more than 80 percent will go to meet government regulations on downsizing and fuel-economy.

General Motors reports that its regulatory costs for the five-year period 1974 to 1978 were almost \$6.2 billion, excluding large expenditures made every year to improve the "fuel economy" of GM cars. In 1978, these expenditures came to \$1.5 billion. The cost of meeting federal regulatory standards, GM estimates, will add \$590 to the cost of one of its typical cars by 1985.

**Steel.** Stated in 1978 dollars, the annual capital input of the steel industry came to \$3.2 billion in the 1960s. In the 1970s, annual capital spending averaged \$2.9 billion, but upwards of 20 percent of that amount was devoted to pollution abatement expenditures.

This year capital expenditures by the industry are projected at \$3.36 billion (in current dollars), while environmental costs are expected to run \$800 million a year over the 1980s.

Mandated pollution abatement spending by the steel industry has locked the industry into an especially vicious trap. The recent capital spending rate, after spending on pollution abatement was deducted, permitted the replacement of only 2.5 percent of the industry's capacity each year. That meant that the average steel facility was being replaced only once every 40 years! The average coke oven, the chief source of pollution, is more than 17 years old. Pollution abatement spending breeds more pollution.

**Electric utilities.** Plant and equipment spending by the electric utilities in 1978 totalled \$23 billion. Roughly 10 percent of that represented spending on pollution abatement. A study prepared by the Electric Power Research Institute has shown, moreover, that the adding of retrofitted scrubbers to coal-fired electrical generating plants has significantly increased their down time. Between 1966 and 1976 available capacity dropped by 6 percent. For every percentage point drop in plant availability, EPRI calculated, \$1 million in dependent business is lost.

Regulatory delays on the licensing and construction of nuclear plants led to a doubling of their cost of construction over the 1970s.

downsized cars. By contrast, in 1978, the entire transport equipment sector accounted for 13.7 percent of the nation's inventory of machine tools, up from 13.1 percent in 1973.

Over the next several months a new area of demand for machine tools is expected to open up: the military sector of the market. However, the unusually high demand from the auto and airframe industries is already straining existing machine tool-producing capacity, because of the undercapitalization of the machine tool industry. The total inventory of U.S. machine tools available for use declined by more than 14 percent between 1973 and 1978. While it is true that the total number of more technologically advanced, numerically controlled machine tools almost doubled over the same five year period, in the base year, numerically controlled machines accounted for only 1 percent of all machine tools. In terms of the average age and obsolescence of machine tools, the U.S. came in last when compared with seven other countries (Table 1). More troublesome even in the view of the industry is the shortage of skilled mechanics to man the capacity.

### Corollary developments in employment

The emphasis on nonproductive over productive capital formation in the U.S. economy correlates with a deterioration in the ratio of operatives employed in the production of tangible wealth to the total national labor force. In a healthy economy, characterized by rising rates of technological progress and real economic growth, increasing rates of new capital formation create and require a rising ratio of skilled, productive employment. Opposite trends have been the rule in the postwar U.S. economy. Graph 3 shows the steady drop in the percentage of employees engaged in goods-producing industries from the end of World War II to the present. At the end of 1979, the percentage stood at 29.7 percent, as compared with 43.5 percent in 1945.

In the 35-year sweep from 1944 through 1979, the total U.S. labor force (agricultural and nonagricultural workers) grew by 41 million workers. But of that increase 39 million workers—95 percent—were added to the services-producing sector. Over the same time period, the manufacturing labor force grew by only 3.5 million.

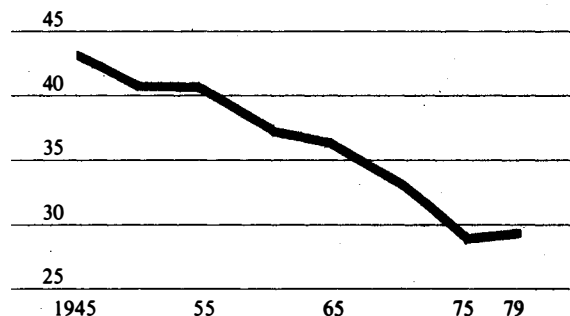
In 1979, the shift in the composition of the labor force emphasizing service employment was brought into relief by the fact that the total number of employed workers continued to grow, holding down the unemployment rate, despite heavy layoffs among auto, steel and other blue collar workers.

**Table 1**  
**Age of machine tools in eight countries**

Country	Year	% under 10 years	% over 20 years
United States	1977	31%	34%
Canada	1978	47	18
F.R.G.	1979	37	27
France	1974	34	33
Italy	1975	42	28
Japan	1973	60	n.a.
United Kingdom	1977	39	24
U.S.S.R.	1971	54	n.a.

Source: 12th American Machinist Inventory of Metalworking Equipment, Dec. 1978

**Graph 3**  
**Employment in goods-producing industries as a percentage of nonagricultural employment**



Source: U.S. Dept. of Labor, Bureau of Labor Statistics

