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What's Behind the Recent Rise in Profitability?

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The recent surge in the stock market has called attention to movements in the underlying rate of profit. Over the last decade and a half, profitability in the total private sector has trended upward, and by 1997, according to some definitions, it was coming close to its postwar peak of the mid-1960s. Even in the corporate business sector, the average rate of return earned on the value of its plant, machinery, and equipment, valued at current cost, declined from a postwar high of 17 percent in 1950 to under 5 percent in 1986 but has since risen to 9.6 percent in 1997.

The crude evidence does suggest that stock prices are linked to corporate profitability. While corporate profitability remained high, from the late 1940s through the late 1960s, the S&P 500 index, deflated to 1995 dollars, increased rather steadily over time. As corporate profits slipped during the 1970s until the early 1980s, so did the S&P 500 index in real terms (both reached a low point in 1982). After 1982, both corporate profits and the S&P 500 index recovered quite strongly. Figure 1, for example, shows the annual change in the corporate profit rate together with the annual change in the S&P 500 index, deflated to 1995 dollars. The simple correlation between the two series from 1950 to 1997 is 0.42.

Movements in the rate of profit have long occupied Marxian economists. Marx himself argued that the rate of profit would tend to decline over the long run. His "law of the tendency of the rate of profit to fall" states that over time the organic composition of capital (the ratio of capital valued in nominal terms to the wage bill) would rise, thereby causing the general rate of profit to fall (Capital, Vol. 3, Ch. 13). This law has been subject to criticism on theoretical grounds (see, for example, Okishio, 1961; Samuleson, 1971; Roemer, 1977; Bowles, 1981), though the more recent literature has reversed some of these theoretical criticisms (see Foley, 1986; Michl, 1994; Thompson, 1995; and Laibman, 1996).

Despite the theoretical disagreements, Marx's theory does provide a useful framework in which to analyze factors which affect movements in the rate of profit and many papers have done this. The earlier ones looked into the factors responsible for what seemed to be a secular decline in profitability in the U.S., from the late 1940s to the mid to late 1980s (see, for example, Wolff, 1979 and 1986; Weisskopf, 1979; Dumenil, Glick, and Rangel, 1987; Moseley, 1988; Michl, 1988; and Shaikh and Tonak, 1994). The recent rise in corporate profitability has been discussed by Baker (1996) and Poterba (1998).

In this paper, I try to account for the recent rise in the profit rate. To make the analysis more accessible, I use a conventional national accounting framework, with analogues to some of the concepts developed in the Marxian framework. I also explore one particular factor that has received relatively little attention in the literature -- namely, the role of structural change on movements in the rate of profit. Marx himself noted the importance of structural shifts in Volume 3 of Capital, "Since the general rate of profit is not only determined by the average rate of profit in each sphere, but also by the distribution of the total social capital among the different individual spheres, and since this distribution is continually changing, it becomes another constant cause of change in the general rate of profit." (p. 169) Moreover, "...new lines of production are opened up, especially for the production of luxuries, and it is these that take as their basis this relative over-population, often set free in other lines of production through the increase of their constant capital. These new lines start out predominantly with living labour, and by degrees pass through the same evolution as the other lines of production. In either case, the variable capital makes up a considerable portion of the total capital..." (p. 237) Differential growth in the various sectors of the economy may thus have important effects on the movement of the rate of profit over time.

The particular mechanism I investigate here is the effect of uneven development on the organic composition of capital, defined here as the ratio of the capital stock in current prices to total wages. Marx argued that it would generally increase over time because of the substitution of fixed capital for labor. However, he noted the presence of several counteracting forces. One was the continual devaluation of capital due to technical change. Another, which we focus on here, is the uneven development among the sectors of the economy. As Marx suggested, the organic composition tends to increase within the various branches of the economy, particularly within manufacturing. However, sectors grow at different rates over time. If employment shifts towards sectors which have a relatively low organic composition, then

this will act to depress the economy-wide organic composition.

I investigate the period from 1947 to 1997 in the U.S. I find, as in previous work (Wolff, 1979 and 1986) that on net there was very little change in the economy-wide organic composition of capital over the period from 1947 to 1997. The trend was not continuous over time and there were periods when the organic composition declined quite sharply. Moreover, I find that the profit rate, based on a variety of measures, fell between 1947 and the early 1980s and then recovered after that. The decline in the earlier period is traceable to rising capital-labor ratios on the industry level and a decline in the profit share, and the recent recovery to a slowdown in capital-labor growth and a rising profit share. Employment shifts were found to be an important counteracting influence to a falling rate of profit, and without such structural change, the rate of profit would have declined substantially over the half century.

The paper is divided into five parts. Part 1 develops the accounting framework and definitions of the variables. In Part 2, I present recent evidence on trends in the rate of profit and the profit share in national income. Part 3 presents results on movements of the organic composition of capital and other factors influencing aggregate changes in profitability. Part 4 analyzes the effect of sectoral shifts on movements in the rate of profit. Concluding remarks are made in the last part, as well as some broader implications of the results.

## ACCOUNTING FRAMEWORK AND DEFINITIONS OF VARIABLES

The basic data are the National Income and Product Accounts for the United States, supplemented with data on private non-residential fixed capital stock. All the data are available on the Bureau of Economic Analysis' website (see Katz and Herman, 1997, for a description of the methodology used in constructing the capital stock data). Define:

$Y$  = row vector of national income generated by industry in 1992 dollars.

$y = \sum Y_i$ , a scalar of total national income in the economy in 1992 dollars.

$L$  = row vector of employment by industry.

$n = \sum L_i$ , a scalar of total employment in the economy.

$K$  = row vector of non-residential fixed capital stock by industry in 1992 dollars.

$k = \sum K_i$ , a scalar of total non-residential fixed capital stock in the economy in 1992 dollars.

$w$  = average compensation for employees and self-employed workers, including fringe benefits, in nominal terms (current dollars).

$p_y$  = the inverse of the national income price deflator.

$\pi = p_y y - wn$  = total profits in the economy in nominal terms.

$p_k$  = the inverse of the price deflator for non-residential fixed capital.

$s$  = row vector showing the distribution of employment among sectors (that is, employment shares), where  $s_i = L_i/n$ .

The ratio of total profits to total worker compensation (the "rate of surplus value") is defined as:

$$(1) \epsilon \equiv \pi / wn.$$

It should be stressed at the outset that the definition of the wage bill used here includes both wage and non-wage compensation for employees and an allocated portion of the income of self-employed workers. The economy-wide "organic composition of capital" is given by:

$$(2) \theta \equiv p_k k / wn.$$

The standard capital-labor ratio (the "technical composition of capital"),  $\tau$ , is given by

$$(3) \tau = k/n.$$

The relation between the organic and technical composition of capital can be derived as:

$$(4) \theta \equiv r \cdot (p_k/w).$$

The rate of profit  $r$  is defined as:

$$(5) \rho = \pi/p_k k.$$

Here it should be noted that the rate of profit is defined as the ratio of profits to the current dollar value of capital.<sup>1</sup>

## POSTWAR TRENDS IN PROFITABILITY

Trends in profitability are shown in Table 1 and Figure 2. The different measures correspond to alternative definitions of surplus income and total national income. I use both gross and net profits, where the former includes the Capital Consumption Allowance or CCA, which is the national accounting measure of depreciation, while the latter does not. Net capital stock is used in the denominator with net profits, since it is close to the ideal of the (net) replacement cost of capital. Properly speaking, gross capital should be used with gross profits to compute the profit rate, but this series was abandoned by the Bureau of Economic Analysis in 1993 (see below). Two sectoral definitions are also used for conventional profit rates: (1) the corporate sector and (2) the private business (non-governmental) sector.<sup>2</sup> The results show a remarkable degree of congruity in profitability trends.

The first series shows the ratio of corporate before-tax income to the net capital stock owned by the corporate sector. After a rather moderate increase, from 15.4 percent in 1947 to 16.9 percent in 1950, corporate profitability plummeted to 9.9 percent in 1958 (a recession year). It then recovered to 14.2 percent in 1966 but slid downward almost continuously over the next two decades, finally bottoming out at 4.8 percent in 1986. Corporate profits have since showed a strong recovery, reaching 9.6 percent in 1997.

The next series extends the definition of profits to include the sum of corporate profits and one half of proprietors' income (see the notes to Table 1 for technical details), and the denominator is concomitantly expanded to total private non-residential fixed capital. The treatment of proprietors' (self-employment) income is always problematic, since it includes both a labor component and a profit component. I have somewhat arbitrarily divided it in half between these two parts. However, experimentation with other divisions (one-fourth labor earnings and three-fourths profits, and three-fourths labor earnings and one-fourth profits) reveals very little difference in overall profitability trends or the results of the subsequent analysis.

In the third, total net property-type income, including corporate profits, interest, rent, and half of proprietors' income, is used as the denominator and total private fixed capital as the numerator. These two series, as well as the corporate profit rate, exhibit very similar trends, rising between 1947 and 1950, falling from 1950 to 1958, rising again to 1966, declining once more until 1986, and then recovering thereafter. The major difference is that net property-type income as a fraction of net capital stock reaches its lowest point in 1982, at 13.1 percent, instead of in 1986. All told, corporate profitability fell by over 9 percentage points between 1947 and 1987, the second series by 12 percentage points, and the third series by 5 percentage points. Each of the three series shows about a three or three and a half percentage point gain between 1987 and 1997.

The gross profit rate measures show similar trends, though the swings are moderated. The first of these, gross corporate profitability, shows a 4 percentage point decline from 1947 to 1987, followed by a 3.4 percentage point recovery by 1997. The sum of corporate profits, one half of proprietors' income, and the CCA as a ratio to the total net private capital stock, fell by over 7 percentage points between 1947 and 1987 and then increased by 2.6 percentage points from 1987 to 1997. The ratio of gross property-type income to net capital stock declined by 4 and a half percentage points between 1947 and its nadir, 20.4 percent in 1980. It then rose by 1.8 percentage points from 1980 to 1987 and by another 3.4 percentage points in 1997.

Table 1 (and Figure 2) also shows trends in the ratio of gross property-type income to gross capital stock for the period from 1947 to 1993.<sup>3</sup> As is evident from the figure, this series moves in almost parallel fashion to the ratio of gross property-type income to net capital stock. Both series rose by about two and a half percentage points from 1947 to 1951, declined by about two and a half percentage points between 1951 and 1958, increased from 1958 to 1965, where both hit their peak postwar level, fell off to 1982, when both hit their lowest level, and then rose again through 1993. The correlation coefficient between the two series over the 1947-93 period is 0.97, which indicates that gross and net capital stock move very closely together.

One conclusion that is already apparent from a comparison of trends in the net and gross profit rates is that the CCA has been rising as a fraction of gross profits -- in the total private sector, from 0.17 in 1947 to 0.32 in 1997 as a share of property-type income. This may partly reflect a shift in the composition of capital away from structures and

towards machinery and equipment, which have shorter life spans and a higher depreciation rate than structures. In fact, the share of machinery and equipment in total fixed private net capital (both in current dollars) has risen from 25 percent in 1947 to 37 percent in 1997. However, this compositional shift is not sufficient to explain the entire rise in the CCA, so its increase might also reflect liberalized accounting rules and the fact that CCA represents a deduction from business income taxes (both corporate and noncorporate). Thus, more of total profits may now be "hidden" in the Capital Consumption Allowance.

Panels C and D of Table 1 and Figure 3 show trends in the profit share in national income for four different measures, corresponding to the profit rate measures.<sup>4</sup> The first is the sum of corporate profits and half of proprietors' income as a fraction of net national income.<sup>5</sup> It fell by over 7 percentage points between 1947 and 1958, stabilized over the next two decades, then fell by another 8 percentage points, reaching its lowest point of 10.6 percent in 1986, and then recovered rather steadily, gaining 5 percentage points by 1997. However, still in 1997, it was 12 percentage point below its peak level in 1950.

The second measure is net property-type income as a fraction of net national income. In contrast to the first, it declined by 7 percentage points between its peak level of 32.0 percent in 1950 and its nadir of 24.8 percent in 1970 but then almost fully recovered to 29.1 percent in 1997. The major difference in the trends of the first two measures is due to the fact that net interest increased as a share of GDP, from 1.1 percent in 1947 to 7.6 percent in 1997.

The third index, the sum of corporate profits, half of proprietors' income, and the CCA as a fraction of gross national income (including CCA), generally tracks the first measure, though with much smaller swings. It fell by about 4 percentage points from 1947 to 1958, remained relatively stable until 1977, fell by another 4 percentage points to its low point in 1986, and then gained 2.5 percentage points from 1986 to 1997. Still in 1997, it was 6 percentage points below its 1947 level. The fourth, gross property-type income as a fraction of gross national income, generally drifted upward over the postwar period, rising by 4 percentage points between 1947 and 1997. This mainly reflects the rising fraction of CCA in gross profits and the rising share of net interest in total national income. Here, again, we see that the gross profit share declined less (or increased more) than the corresponding net profit share. Moreover, the inclusion of property income other than corporate and noncorporate profits in the measure of total surplus also results in a more pronounced upward trend in the profit share. Indeed, according to this, the most inclusive, definition, the profit share was at its postwar peak in 1997.

Which definition of profits makes the most sense? The Bureau of Economic Analysis proposes a measure which includes traditional corporate profits, total proprietor's income, and property-type income as their preferred concept of the profit share. I have modified this slightly by excluding half of proprietors' income (PTI) and I think that this is the best concept to use. The Bureau of Economic Analysis also includes CCA in its definition of the profit share. I think that a legitimate case can be made for both including it and excluding it, so that I will continue to show results for both gross and net profit rates.

## DECONSTRUCTING TRENDS IN THE PROFIT RATE

### The Capital-Output Ratio

I next look at the underlying factors affecting movements in aggregate profitability. From (5), it follows that:

$$(6) \rho \equiv \pi/p_k k = (\pi/p_y y) \cdot (p_y/p_k k).$$

where  $\pi/p_y y$  is the share of total profits in national income and  $p_y y/p_k k$  is the capital-output ratio in nominal terms. The rate of profit thus moves proportionately to the profit share but inversely to the capital-output ratio in value terms.

Table 2 and Figure 4 show that the capital-output ratio in value terms rose rather gradually between 1947 and 1958, from 1.22 to 1.33, fell to its low point of 1.13 in 1966, increased sharply thereafter, reaching a peak value of 1.57 in 1982 and then declined rather continuously to 1.23 in 1997. It is clear that movements in the rate of profit parallel those of the capital-output ratio, falling between 1947 and 1958, rising from 1958 to 1967, falling through the early to mid-1980s and then trending upward thereafter. However, swings in the profit rate are much steeper than corresponding shifts in the capital-output ratio. Moreover, whereas the capital-output ratio is almost the same in 1997 as in 1947, profit rates are generally lower in the later year (depending on the measure used).

From (6), it is possible to decompose movements in the capital-output ratio in value terms into two effects, as follows

$$(7) p_y y/p_k k = (y/k) \cdot (p_y/p_k)$$

The first term of (7) is the capital-output ratio in constant dollars and the second term to the price of capital goods

relative to the average price level (that is, the GDP price deflator).

Between 1947 and 1957, there was a moderate decline in the capital-output ratio in constant dollars but the value of capital goods relative to GDP rose from 0.94 to 1.04, causing the capital-output ratio in value terms to rise. Both the capital-output ratio in constant dollars and the relative price of capital goods fell between 1957 and 1967, causing a drop in the capital-output ratio in current values. From 1967 to 1977, a sharp rise in the first two factors caused an even steeper rise in the capital-output ratio in value terms. After 1977, the relative price of capital goods continued to climb, peaking at 1.19 in 1980, as did the capital-output ratio in constant prices reaching 1.37 in 1982 and resulting in a further rise in the capital-output ratio in value terms to its peak value of 1.57 in 1982. After 1982, the two factors generally trended downward, causing the capital-output ratio in value terms to decline. Interestingly over the half century from 1947 to 1997, there was almost no net change in either measure of the capital-output ratio and only a slight increase in the relative price of capital goods.

### The Ratio of Profits to Worker Compensation.

Since it is hard to analyze movements in the capital-output ratio directly, a somewhat more illuminating decomposition of the rate of profit can be obtained as follows:

$$(8) \rho \equiv \pi/p_k k = (\pi/wn) / (p_k k/wn) = \epsilon/\theta$$

where  $\epsilon = \pi/wn$  is the ratio of total profits to total worker compensation (or "wages" for short) and  $\theta = p_k k/wn$  is the organic composition of capital -- the ratio of the capital advanced in nominal terms to the total wage bill. We can then treat the two terms of equation (8) separately.

The first term can be further decomposed as follows:

$$(9) \epsilon = \pi/wn = (p_y y - wn)/wn = (p_y y/wn) - 1 = (y/n) / [(w/p_c)(p_c/p_y)] - 1$$

where  $y/n$  is labor productivity,  $p_c$  is the Consumer Price Index (CPI),  $w/p_c$  is the real wage (average nominal wages deflated by the CPI) and  $p_c/p_y$  is the ratio of the CPI to the GDP price index. As long as consumer prices move in tandem with the general price level, the ratio of total profits to total wages will increase (decrease) if labor productivity rises faster (slower) than the real wage.

Movements of the variables are shown in Panel B of Table 2 and Figure 5. Two productivity measures are used: the ratio of net national income to employment (persons engaged in production), which corresponds to the net profit share, and the ratio of gross national income to employment, which corresponds to the gross profit share. Between 1947 and 1987, real wages grew at the same rate as the ratio of net national income to employment. At the same time, consumer prices rose relative to the overall price level, causing the net profit share (the ratio of property-type income less the CCA to net national income) to decline. Between 1987 and 1997, net labor productivity increased faster than real wages and, though consumer prices again increased relative to the GDP deflator, the net profit share rose. Over the entire 1947-97 period, net labor productivity increased slightly more than mean compensation but the CPI rose relative to the GDP deflator, resulting in almost no net change in the net profit share.

In contrast, between 1947 and 1977, gains in gross labor productivity (the ratio of gross national income to employment) generally equalled those in real wages but consumer prices declined relative to the overall price level, causing the gross profit share (the ratio of total property-type income to gross national income) to rise. Between 1977 and 1997, productivity increases outstripped wages and, despite the relative increase of the CPI, the gross profit share continued to rise.

### The Organic Composition

The second term of equation (8) can also be decomposed, as follows:

$$(10) \theta = p_k k/wn = (k/n)(p_k/w)$$

The first term of equation (10) is the conventional capital-labor ratio. The second term,  $p_k/w$ , indicates how much wages must be paid in order to obtain one unit of capital. It is like the average labor content of capital, except in wage terms instead of labor terms. In so far as wages tend to move with overall labor productivity, this term principally reflects the falling amount of labor (both direct and indirect) required to produce one unit of capital. When advances in the capital-labor ratio outstrip the effects of labor productivity growth in reducing the labor content of capital, then the organic composition will rise, and conversely.

Both standard neo-classical analysis and Marxian theory (Volume 3 of *Capital*) argue that the capital-labor ratio will generally rise over time. This is principally a result of a rising real wage, which will induce firms to substitute physical capital for labor. A second reason is that even without higher real wages, more physical capital-intensive technology may be absolutely more productive than labor-intensive technology. Firms can thus lower costs by investing in the more capital-intensive technology.

The increase in the capital-labor ratio will cause labor productivity to increase for two reasons. First, the increase in the physical capital-labor ratio will cause output per person hour to rise.<sup>6</sup> Second, insofar as the more physical-capital intensive production techniques embody more productive technology, labor productivity will increase. An increase in labor productivity will, in turn, cause total (direct plus indirect) labor requirements to decline per unit of capital and thus the ratio  $p_k/w$  to fall. Interestingly, Marx saw this offsetting effect as relatively minor. However, as we will see, the fall in the labor content of physical capital has been almost as great as the rise in the capital-labor ratio.

Panel C of Table 2 and Figure 6 show trends in the organic composition of capital. As is evident, there is no strong secular pattern. After rising between 1947 and 1958, from 2.04 to 2.28, the organic composition fell to 1.97 in 1966, reversed direction and reached its peak of 2.70 in 1982, and then retreated to a value of 2.15 in 1997. Over the entire half century, there was a slight increase in the organic composition of capital.

Between 1947 and 1957, the capital-labor ratio grew by 28 percent, whereas the ratio of the capital price level to nominal wages fell by only 16 percent, causing a sharp increase in the organic composition. From 1957 to 1967, the rate of decline of the labor content of capital exceeded that of the growth of the capital-labor ratio and the organic composition slipped back to its 1947 level. Between 1967 and 1982, capital-labor growth was much stronger than the productivity growth in producing capital, causing a sharp jump in the organic composition, and from 1982 to 1997, the reverse occurred. Over the entire half century, the labor content of capital fell by half but the capital-labor ratio more than doubled, causing a moderate increase in the organic composition of capital.

### Decomposition of Changes in Profitability

Tables 3 and 4 present a formal decomposition of changes in the rate of profit into its constituent components: wage changes, productivity growth, movements in the capital-labor ratio, and changes in the ratio of the price of capital to wages. These are based on equations (8), (9), and (10). From (10), for example, we obtain:

$$(11) \quad d\pi = d\tau(p_k/w) + \tau \cdot d(p_k/w).$$

where  $\tau = k/n$ . Because we use discrete time periods, the differential form of equation (11) must be modified. Various choices of weights are possible. I use average period weights, because they give an exact decomposition.<sup>7</sup>

Table 3 shows the decomposition for the net rate of profit. It is first of interest to look at the bottom panel of Table 3. The growth in both real wages and labor productivity show a marked slowdown in the 1967-77 period and again in the 1977-87 period. Both recovered in the 1987-97 period but whereas labor productivity growth rose to one percent per annum, the growth in real wages increased to only 0.3 percent per annum. During the period before 1987, wages increased faster than labor productivity, accounting for the decline in the net profit share but after 1987 labor productivity outstripped wages, causing an increase in the profit share.

Interestingly, part of the slow increase in the real wage in the 1987-1997 period is attributable to the faster increase in the CPI than the GDP deflator. The annual increase in the CPI was 0.4 percentage points greater than that of the GDP deflator. If "real wages" were defined as wages deflated by the GDP price index, then real wages would have increased at 0.7 percent per annum, close to that of labor productivity. The faster increase in the CPI than the GDP deflator likely reflects slower productivity growth in the production of consumer goods and services, compared to those consumed for investment or by the government or exported.

The rate of increase of the capital-labor ratio, on the other hand, shows an almost continuous slowdown over time. The rate of change in the labor content of capital (as reflected in the price of capital as a ratio to average wages) shows no clear trend over time. Between 1947 and 1957, the capital-labor ratio grew by 2.5 percent per year, whereas the ratio of the price of capital to wages fell by 1.7 percent per year, causing a sharp increase in the organic composition. From 1957 to 1967, the latter declined at its fastest rate while the capital-labor ratio grew at the same rate, and the organic composition fell sharply. Between 1967 and 1977, capital-labor growth was much stronger than the productivity growth in producing capital, causing a sharp jump in the organic composition, and from 1977 to 1997, declines in the labor value of constant capital outpaced increases in the capital-labor ratio, causing the organic composition to fall once again.

The rate of profit tends to move inversely to the organic composition (see Panel C). When the organic composition falls,

the value rate of profit usually rises (the only exception is the 1977-87 period, when the organic composition fell slightly and the rate of profit also fell slightly). The main reason for this is that the profit share fluctuates much less over time than the organic composition.

The second decomposition of the profit rate (Panel D) is a bit more illuminating. Here it is apparent that the two dominant effects on movements in the net rate of profit come from changes in the real wage and the growth in overall labor productivity. Both these effects have tailed off over time, with productivity growth outrunning wages since 1987. The effects of a rising capital-labor ratio on the profit rate have also fallen off steadily over time, and the effect of the falling labor content of capital (falling ratio of the capital price to wages) also declined after 1967. If we aggregate the labor productivity effect, the capital-labor ratio effect, and the effects of a changing labor content of capital (itself a result primarily of rising productivity growth in the manufacture of capital goods) into a single technology effect, then it is clear that the combined technology effect has almost steadily fallen off over time. However, since 1987, it has declined less rapidly than the growth in mean wages. In sum, the two dominant causes for the recent rise in profitability since 1987 are the slowdown in the growth of real wages and the marked slowdown in the increase in the capital-labor ratio.

The results are a bit different in Table 4, which decomposes changes in the gross profit rate. The growth in (gross) labor productivity, defined now as the ratio of gross national income to employment, experienced the same slowdown in 1967 and another slowdown in 1977 as the growth in net labor productivity and wages. In this case, real wage growth equaled labor productivity growth in the 1947-57 and 1957-67 periods but a decline in the price of consumption goods relative to the GDP deflator resulted in a rise in the ratio of gross profits to wages. In both the 1977-87 and 1987-97 periods, gross labor productivity outpaced real wage gains, causing the ratio of gross profits to wages to expand during these years despite a relative increase in the price of wage goods. Over the entire half century, gross labor productivity grew 0.3 percentage points per year faster than real wages and, though the CPI increased relative to the GDP deflator, the ratio of gross profits to wages rose by 9.0 percentage points (while the ratio of net profits to wages declined by 1.0 percentage points).

The decomposition of changes in the organic composition are exactly the same as for movements in the net profit rate. As a result, the gross value rate of profit actually increased by 3.0 percentage points over the half century (while the net value rate of profit fell by 1.5 percentage points). However, as with the net rate of profit, the recovery in the gross rate of profit after 1987 was due to the marked slowdown in both wage growth relative to productivity growth and the growth in the capital-labor ratio.

#### SECTORAL DECOMPOSITION OF THE ORGANIC COMPOSITION OF CAPITAL, 1947-1997

As noted in the Introduction, Marx argued that one possible offsetting factor to a rising organic composition of capital is the shift of capital to the relatively more labor-intensive sectors of the economy. We explore this effect in this section.

It should be noted at the outset that sectoral shifts of capital may have other effects on the rate of profit. For example, capital may also shift to sectors with higher profit rates, with higher profit shares, with lower wages, with different productivity levels, or with different productivity growth rates. Any of these shifts may also affect the overall profit rate and its movement over time. However, there is reason to believe that forces of competition will, at least, tend to equalize profit rates and wage rates across sectors, at least in the long-run. However, there is no reason for capital-labor ratios to equalize across sectors, since they are technology-specific. Therefore, in a secular analysis, it makes sense to limit the decomposition analysis to differences in both capital intensity and organic composition among sectors of the economy.

We can formally analyze this effect as follows. The organic composition of sector  $j$ ,  $\theta_j$ , is given by:

$$(12) \theta_j = p_k K_j / w L_j = r_j \cdot (p_k / w)$$

where  $r_j = K_j / L_j$  is the capital-labor ratio in sector  $j$ . Moreover, the economy-wide organic composition can now be seen as a weighted sum of the organic compositions of the individual sectors, where the weights are the labor shares  $s_j$ :

$$(13) \theta = \sum s_j \theta_j.$$

In like fashion, the economy-wide capital-labor ratio is also given as a weighted sum of the capital-labor ratios of each industry, where the weights are employment shares:

$$(14) r = \sum s_j r_j.$$

Table 5 shows the capital-labor ratios by major sector and year. There is considerable variation in the capital-labor ratios of the various sectors. In 1997, for example, they ranged from a low of \$20,000 (in 1992 dollars) per worker in labor-intensive services to a high of \$1,661,000 per worker in public utilities. The coefficient of variation in industry capital-labor ratios, defined as the ratio of the standard deviation to the unweighted mean, was quite high in each of the six years, ranging from 1.9 to 2.3. This indicates that changes in sectoral composition could induce major changes in the overall capital-labor ratio. The time trend in the coefficient of variation is relatively flat, indicating no convergence (or divergence) in capital-labor ratios among industries.

Over the 1947-87 period, the capital-labor ratio increased in 11 of the 12 major sectors (in transportation it declined very slightly), and rose in almost every subperiod as well. Over these years it rose most rapidly in agriculture, mining, communications, and wholesale trade, and slowest in construction, transportation, and finance, insurance, and real estate. Between 1987 and 1997, growth in capital intensity slowed down substantially. In 10 of the 12 major sectors, the growth in the capital-labor ratio was down from its 1947-87 level and in 3 (agriculture, construction, and transportation) it was negative.

The bottom panel of Table 5 shows similar statistics for sectoral organic compositions. There is also considerable variation in the organic composition among sectors. In 1997, it ranged from a low of 0.4 in construction to a high of 12.1 in mining. The coefficient of variation was quite high in each year, ranging from 1.7 to 2.0. Moreover, there was no tendency for the variation in sectoral organic compositions to decline (or increase) over time. The large variation indicates that shift effects are potentially very important in movements of the overall organic composition over time.

There are also considerable differences in changes in the organic composition over time among the various sectors. In only two sectors -- wholesale trade and retail trade -- did the organic composition increase in each of the five subperiods. In agriculture, mining, communications, and public utilities, it rose between 1947 and 1987 and then declined between 1987 and 1997. In both durable and nondurable manufacturing, it increased in both periods, while in construction, transportation, and services it declined in both periods.

Over the entire 1947-97 period, the organic composition increased in 8 sectors and declined in 4 -- construction, transportation, finance, insurance, and real estate, and services. The organic composition showed the greatest increases in agriculture, mining, and wholesale trade; it increased moderately in durable and nondurable manufacturing, communications, and retail trade; and showed a slight increase or an absolute decline in the other sectors.

We can now formally decompose the effects of sectoral employment shifts on changes in the overall capital-labor ratio, the organic composition, and the rate of profit. From (14), it follows that:

$$(15) \quad \dot{c}r = \sum s_j \dot{c}r_j + \sum (ds_j) \bar{c}r_j.$$

The top panel of Table 6 shows the results of this decomposition. The sectoral capital-labor effect (the first term in (15)) is positive in each of the five periods. However, while the growth in the capital-labor ratio on the industry level remained strong from 1947 to 1987, it fell off sharply in the 1987-1997 period. Still, if industry employment shares had remained constant over the entire half century, the overall capital-labor ratio would have grown three and a half times, from 33.0 to 117.4, instead of increasing by 119 percent, from 33.0 to 72.2.

The difference is due to shifts in the composition of employment toward more labor-intensive industries. This effect is uniformly negative over each of the periods, and the magnitude of the effect is relatively constant over time, except for the 1957-67 and the 1977-87 periods, when it was particularly high. Over the half century, the employment shift effect was only about half as great as the sectoral effect, accounting for the overall rise in the capital-labor ratio. The slowdown in growth of the overall capital-labor ratio after 1987 is due almost entirely to a slowdown in the increase of the capital-labor ratio on the industry level, rather than to an acceleration of the employment shift effect.

From (13), we obtain the corresponding decomposition of the change in the organic composition:

$$(16) \quad \dot{c}b = \sum s_j \dot{c}b_j + \sum (ds_j) \bar{c}b_j.$$

As shown in Panel B of Table 6, the effect of sectoral changes in the organic composition on the overall organic composition (the first term of (16)) is positive in each of the first four periods but becomes negative in the 1987-97 period. The effect is particularly strong in the 1947-57 and 1967-77 periods. Over the entire half century, if industry employment shares had remained constant, the overall organic composition would have risen by 54 percent, from 2.0 to 3.1, instead of increasing by only 5 percent.

Employment shifts were generally toward sectors that had relatively low organic compositions, except for the 1967-77 and 1987-97 periods, when the effect was more or less neutral. The employment shift effect was particularly strong in the 1958-67 and the 1977-87 periods, as it was for changes in the overall capital-labor ratio. If the organic composition



had remained constant on the industry level, the overall organic composition would have fallen by half, instead of experiencing a small increase. Over the full half century, the sectoral effect was slightly stronger than the employment shift effect, accounting for the modest gain in the overall organic composition. The decline in the organic composition after 1987 was mainly due to the fact that the sectoral effects became negative.

The movement of the rate of profit over time is due to two major effects: changes in the share of profits in value added and movements in the organic composition. The latter, in turn, is due to movements in sectoral organic composition levels and shifts in the employment shares among industries. On the basis of equations (8) and (16), we can separate out the effects of shifts in employment composition on the movement of the overall rate of profit. Results are shown in Panels C and D for the two profit rate measures.

The results show rather persuasively that structural shifts were an important offset to rising organic composition on the industry level. Over the entire half century, rising organic composition on the industry level would have caused the net rate of profit to fall by 10 percentage points and the gross rate of profit to fall by 14 percentage points if employment shares had remained constant. The shift in employment toward the more labor intensive industries almost fully counteracted the increase in the organic composition on the industry level -- by itself, responsible for an 9 percentage point increase in the net rate of profit and a 13 percentage point increase in the gross rate of profit. The employment effects were again strongest in the 1958-67 and 1977-87 periods. In the 1987-97 period, falling organic compositions on the sectoral level, coupled with employment shift effects and a rising profit share in income, led to a resurgence in the rate of profit (both net and gross).

## CONCLUSIONS

Movements in the rate of profit are attributable to technological factors (changes in capital intensity, productivity growth, and relative price movements) and structural factors (shifts in employment among sectors), as well as to changes in the profit and wage shares. The latter, in turn, may to some extent reflect changing power relations in the economy between capital and labor. In particular, a reasonable presumption might be that an equal division of power between capital and labor should lead to real wages increasing at about the same rate as overall labor productivity. If wages increase slower, we might suspect that the balance of power has shifted toward capital, and conversely.

For the last analysis, I divide the postwar years into three epochs: 1947-1965, 1965-1982, and 1982-1997. The first is a period of rising profitability, the second a period of declining profitability, and the third one of recovery in the profit rate (see Table 7). During the first of these three periods, the gross rate of profit increased by 4.3 percentage points, while the net rate of profit showed almost no change. In the case of the former, the primary reason is a substantial rise in the profit share (3.1 percentage points), since the overall organic composition remained almost unchanged. In this period, the rising profit share did not seem to reflect undue power of capital, since real wages increased at almost the same rate as (gross) labor productivity. Rather, the reason is technological -- namely, that the price of personal consumption goods were falling relative to other components of GDP, by 0.20 percent per year on average. In other words, if wages are deflated by the GDP deflator instead of the CPI, then "real wage" growth would have fallen far short of labor productivity growth. Relative price movements appear to provide the main explanation for rising profitability during the early postwar period.

During the second period, both the net rate of profit and the gross rate of profit fell substantially (by 8.2 and 8.5 percentage points, respectively). During this period, the net profit share fell by 3.7 percentage points and the gross profit share fell by a smaller 1.0 percentage points. However, this is not apparently due to the rising power of labor, since real wages increased slower than labor productivity (both net and gross) in these years. Indeed, if anything, this period appears to be characterized by a shift of power in favor of capital. Rather, the reason is that the price of consumption goods rose rather sharply relative to other components of GDP (by 0.4 percent per year).

During the 1965-1982 period, the organic composition also rose sharply, which acted as another contributory cause to the falling rate of profit. Interestingly, this is not due to an acceleration in the growth of the capital-labor ratio, since it fell from 2.4 percent per year in the preceding 18-years to 1.8 percent per year. Rather, the reason here is also relative price changes, since the price of capital goods valued in wage terms, which had declined by a robust 2.5 percent per year in the 1947-65 period, declined by only 0.1 percent per year in the 1965-82 period. The failure of the labor content of capital goods to decline as fast as in preceding years led to a sharp rise in the organic composition and a resulting fall in the profit rate.

In the most recent period, profitability rebounded (by 6.0 percentage points for the net profit rate and by 7.2 percentage points for the gross profit rate). Both the net and gross profit share also rose (by 2.9 and 1.6 percentage points, respectively). In this period as well as the preceding one, real wages increased less rapidly than labor productivity (both net and gross), again apparently reflecting the continued ascendancy of capital over labor. The relative price of consumption goods continued to rise relative to the GDP deflator, but not enough to offset the gap between labor productivity and real wage growth.

During this period the organic composition also declined, contributing to the rise in the profit rate. Here, the primary cause is the marked slowdown in the growth of the capital-labor ratio, which fell to only 0.3 percent per year. Augmenting this effect was another large decline in the price of capital goods relative to nominal wages (at 1.8 percent per year).

Technological change, particularly as reflected in relative price movements and changes in capital intensity on the industry level, appears to explain most of the movements of the rate of profit over the postwar period. However, over the entire half century, structural change, particularly the shift of employment toward labor intensive services, acted as an important offset to the tendency of the rate of profit to fall. The effect was relatively consistent throughout the three periods -- reducing the growth of the capital-labor ratio by 1.1 percent per year in the 1947-65 period, by 0.8 percent per year in the 1965-82 period, and by 1.0 percent per year in the 1982-97 period. Without it, the net profit rate would have fallen by 10 percentage points over the half century and the gross profit rate by 14 percentage points.

Another factor in explaining recent changes in profitability is the apparent shift in power to capital over labor beginning in the late 1960s or early 1970s. Though this effect was overtaken by the effect of technological changes in the 1965-82 period, it shows up in recent increases in the profit rate, beginning in the early 1980s. What explains this shift in power? This topic is beyond the scope of the current paper. However, some possible causes and manifestations of this phenomenon are the decline in the unionization rate (though this has been going on since about 1954); Ronald Reagan's dismissal of unionized air controller workers during the 1982 PATCO strike; the falling value of the minimum wage in real terms (since 1968); growing international trade since the end of Bretton-Woods in 1973 and the consequent downward pressure on the wages of American manufacturing workers from rising imports; and circumstantial evidence of corporate downsizing and increased outsourcing of production to less developed countries (see my 1999 paper for a review of the literature).

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**Table 1**  
**Trends in Profitability and the Profit Share, 1947-1997**  
(all figures are in percent)

	1947	1957	1967	1977	1987	1997	Change 1947-97
<b>A. Net Profit Rates</b>							
1. PBT/NETK (Corporate)	15.4	11.5	12.5	10.1	6.1	9.6	-5.7
2. (PBT+PI?.5)/NETK	19.2	13.6	13.7	10.7	7.1	10.1	-9.1
3. (PTI-CCCA-NCCA)/NETK	20.6	18.2	19.9	15.6	15.4	19.1	-1.5
<b>B. Gross Profit Rates</b>							
1. (PBT+CCCA)/NETK(corporate)	18.5	16.9	19.8	16.2	14.7	18.1	-0.5
2. (PBT+.5PI+CCCA+NCCA)/NETK	23.5	20.2	21.6	17.3	16.2	18.8	-4.7
3. PTI/NETK	24.9	24.8	27.8	22.2	24.5	27.9	3.0
4. PTI/GROSSK	18.2	18.5	20.7	16.0	17.1	--	--
<b>C. Net Profit Shares</b>							
1. (PBT+.5PI)/NNI	27.6	21.4	19.7	18.9	12.3	15.7	-11.9
2. (PTI-CCCA-NCCA)/NNI	29.6	28.6	28.5	27.5	26.7	29.1	-0.5
<b>D. Gross Profit Shares</b>							
1. (PBT+.5PI+CCCA+NCCA)/GNI	31.8	28.8	27.8	27.3	24.3	25.7	-6.2
2. PTI/GNI	33.7	35.4	35.8	35.1	36.7	37.5	3.8

*Note:* Data are from the Bureau of Economic Analysis' National Income and Product Accounts and Net Stock of Fixed Reproducible Tangible Capital accounts, provided on the Internet. The calculations are for the private (non-governmental) sector, unless otherwise indicated. Key:

*PBT:* Corporate profits before tax

*PI:* Proprietors' income

*PTI:* Property-type income, defined as the sum of corporate profits, half of proprietors' income, rental income of persons, net interest, capital consumption allowances, business transfer payments, and the current surplus of government enterprises less subsidies. Because proprietors' income includes both labor income and a return on capital, I have arbitrarily included half of it in property-type income.

*CCCA:* Corporate Capital Consumption Allowance

*NCCA:* Noncorporate Capital Consumption Allowance

*GDP:* Current dollar Gross Domestic Product.

*COMP:* Compensation of employees, which consists of wage and salary accruals, employer contributions for social insurance, and other labor income.

*PEP:* Persons Engaged in Production.

*NETK:* Current-cost net stock of fixed reproducible tangible non-residential private capital stock.

*GROSSK:* Current-cost gross stock of fixed reproducible tangible non-residential private capital stock.

*NNI:* Net national income, defined as COMP+PTI-CCCA-NCCA.

*GNI:* Gross national income, defined as COMP+PTI. GNI equals GDP less indirect business tax and nontax liability.

**Table 2**  
**The Capital-Output Ratio, Labor Productivity, Mean Compensation,**  
**The Capital-Output Ratio and the Organic Composition of Capital, 1947-1997**

	1947	1957	1967	1977	1987	1997	Change 1947-97
<b>A. Capital-Output Ratio</b>							
Capital-output ratio, current values (NETK/GDP)	1.22	1.30	1.16	1.41	1.37	1.23	0.01
GDP price level / capital price level (py/pk)	0.94	1.04	0.99	1.14	1.06	0.99	0.06
Capital-output ratio, constant prices [NETK(1992\$)/GDP(1992\$)]	1.30	1.25	1.17	1.24	1.29	1.24	-0.06
<b>B. Labor Productivity and the Real Wage</b>							
NNI (1992\$) / PEP [Index, 1947=1.00]	1.00	1.30	1.69	1.89	1.98	2.19	1.19
GNI (1992\$) / PEP [Index, 1947=1.00]	1.00	1.35	1.77	1.99	2.16	2.34	1.34
COMP+PI*.5 (1992\$) / PEP [Index, 1947=1.0]	1.00	1.36	1.78	1.99	1.97	2.02	1.02
CPI / GDP Deflator	0.93	0.90	0.90	0.91	0.97	1.02	0.09
<b>C. Composition of Capital</b>							
NETK (1992\$) / PEP [Index, 1947=1.0]	1.00	1.28	1.59	1.91	2.11	2.19	1.19
Capital price level/ nominal wage [Index, 1947=1.0]	1.00	0.84	0.62	0.63	0.55	0.48	-0.52
Organic Composition [NETK/ (COMP+PI*.5)]	2.04	2.20	2.01	2.44	2.37	2.15	0.11

*Note:* The calculations are for the private (non-governmental) sector.

**Table 3**  
**Percentage Decomposition of Changes in the Net Rate of Profit**  
**By Period, 1947-1997**

1947-1957 1957-1967 1967-1977 1977-1987 1987-1997 1947-1997

	1947-1957	1957-1967	1967-1977	1977-1987	1987-1997	1947-1997
<b>A. Net Profits / Total Wages</b>						
Actual change in net profits/wages [percentage points]	-1.9	-0.2	-1.9	-1.5	4.5	-1.0
Percentage point contribution:						
Change in wage/GDP deflator	-39.6	-36.9	-17.9	-7.6	-9.8	-124.1
Change in labor productivity	37.7	36.7	15.9	6.2	14.3	123.1
<b>B. Organic Composition</b>						
Actual change in organic composition	0.16	-0.20	0.43	-0.06	-0.23	0.11
Contribution of:						
Change in capital/labor ratio	0.53	0.46	0.40	0.24	0.09	1.80
Change in $P_k/w$	-0.37	-0.66	0.02	-0.30	-0.31	-1.69
<b>C. Net Rate of Profit</b>						
Actual change profit rate [% points]	-2.4	1.7	-4.3	-0.2	3.7	-1.5
Percentage point contribution:						
Change in profits/wages	-0.9	-0.1	-0.9	-0.6	2.0	-0.5
Change in organic comp.	-1.5	1.8	-3.4	0.4	1.7	-1.0
<b>D. Net Rate of Profit</b>						
Actual change profit rate [% points]	-2.4	1.7	-4.3	-0.2	3.7	-1.5
Percentage point contribution:						
Change in wage/GDP deflator	-18.7	-17.6	-8.1	-3.2	-4.4	-59.3
Total technology effect	16.3	15.8	3.8	3.0	8.1	57.8
Change in labor productivity	17.8	17.5	7.2	2.6	6.4	58.8
Change in capital/labor ratio	-4.9	-4.2	-3.2	-1.5	-0.7	-17.0
Change in $p_k/w$	3.4	5.9	-0.2	1.9	2.4	16.0
<b>Addendum: Average Annual Rate of Growth</b>						
Real wage [CPI deflator]	3.1	2.7	1.2	-0.1	0.3	1.4
Wage / GDP deflator	2.8	2.6	1.3	0.6	0.7	1.6
CPI/GDP deflator	-0.3	-0.0	0.1	0.7	0.4	0.2
Labor productivity	2.6	2.6	1.1	0.4	1.0	1.6
Capital/labor ratio	2.5	2.2	1.8	1.0	0.4	1.6
Capital price level/wages ( $p_k/w$ )	-1.7	-3.1	0.1	-1.2	-1.4	-1.5

*Note:* The decomposition is based on equations (8), (9), and (10). Average period weights are used. Key:

Net profits = (PTI-CCCA-NCCA).

Net output = NNI.

Real wage = [(COMP+PI\*.5)/CPI]/PEP

Labor productivity = NNI (1992\$) / PEP

**Table 4**  
**Percentage Decomposition of Changes in the Gross Rate of Profit**  
**By Period, 1947-1997**

1947-1957 1957-1967 1967-1977 1977-1987 1987-1997 1947-1997

**A. Gross Profits / Total Wages**

Actual change in gross profits/wages [percentage points]	3.9	1.0	-1.8	4.1	1.8	9.0
Percentage point contribution:						
Change in wage/GDP deflator	-43.0	40.9	-19.9	-8.7	-11.3	-138.0
Change in labor productivity	46.9	41.9	18.1	12.8	13.1	147.0

**B. Organic Composition**

Actual change in organic composition	0.16	-0.20	0.43	-0.06	-0.23	0.11
Contribution of:						
Change in capital/labor ratio	0.53	0.46	0.40	0.24	0.09	1.80
Change in $p_k/w$	-0.37	-0.66	0.02	-0.30	-0.31	-1.69

**C. Gross Rate of Profit**

Actual change profit rate [% points]	-0.1	2.9	-5.6	2.3	3.4	3.0
Percentage point contribution:						
Change in profits/wages	1.8	0.5	-0.8	1.7	0.8	4.3
Change in organic comp.	-1.9	2.4	-4.8	0.6	2.6	-1.3

**D. Gross Rate of Profit**

Actual change profit rate [% points]	-0.1	2.9	-5.6	2.3	3.4	3.0
Percentage point contribution:						
Change in wage/GDP deflator	-20.3	-19.5	-9.0	-3.6	-5.0	-66.0
Total technology effect	20.2	22.5	3.4	5.9	8.4	69.0
Change in labor productivity	22.1	20.0	8.2	5.3	5.8	70.3
Change in capital/labor ratio	-6.2	-5.7	-4.5	-2.3	-1.0	-22.7
Change in $p_k/w$	4.3	8.2	-0.3	2.9	3.6	21.4

**Addendum: Average Annual Rate of Growth**

Real wage [CPI deflator]	3.1	2.7	1.2	-0.1	0.3	1.4
Wage / GDP deflator	2.8	2.6	1.3	0.6	0.7	1.6
CPI/GDP deflator	-0.3	-0.0	0.1	0.7	0.4	0.2
Labor productivity	3.0	2.7	1.2	0.8	0.8	1.7
Capital/labor ratio	2.5	2.2	1.8	1.0	0.4	1.6
Capital price level/wages ( $p_k/w$ )	-1.7	-3.1	0.1	-1.2	-1.4	-1.5

*Note:* The decomposition is based on equations (8), (9), and (10). Average period weights are used. Key:

Gross profits = PTI

Gross output = GNI.

Real wage = [(COMP+PI\*.5)/CPI]/PEP

Labor productivity = GNI (1992\$) / PEP

**Table 5**  
**The Capital-Labor Ratio and the Organic Composition of Capital**  
**By Sector and Year, 1947-1997**

	Year						Annual Percentage Growth Rate		
	1947	1957	1967	1977	1987	1997	1947- 1987	1987- 1997	1947- 1997
<b>A. Capital-Labor Ratio</b>									
Agriculture, forestry, fishing	17	35	70	112	110	101	4.6	-0.9	3.5
Mining	108	196	375	349	607	655	4.3	0.8	3.6
Construction	8	10	14	18	13	11	1.2	-1.3	0.7
Durable manufacturing	18	23	30	42	56	65	2.9	1.4	2.6
Nondurable manufacturing	26	32	40	58	72	87	2.6	1.9	2.4
Transportation	188	199	205	211	185	150	-0.0	-2.1	-0.5
Communications	49	80	143	219	335	428	4.8	2.4	4.3
Public utilities	367	522	678	844	896	1061	2.2	1.7	2.1
Wholesale trade	6	8	15	24	44	61	5.0	3.2	4.6
Retail trade	9	12	17	19	21	25	2.0	2.0	2.0
Finance, insurance, real estate	94	106	144	156	187	247	1.7	2.8	1.9
Services	8	12	16	19	19	20	2.0	0.6	1.7
Total private	33	42	53	63	70	72	1.9	0.4	1.6
Coefficient of variation	2.04	2.06	2.11	2.27	1.93	2.04			
<b>B. Organic Composition</b>									
Agriculture, forestry, fishing	1.33	3.45	4.53	7.24	6.60	5.71	4.0	-1.5	2.9
Mining	5.13	7.24	9.39	9.23	13.46	12.08	2.4	-1.1	1.7
Construction	0.43	0.44	0.43	0.57	0.42	0.36	-0.1	-1.4	-0.4
Durable manufacturing	0.91	0.96	0.94	1.24	1.43	1.44	1.1	0.0	0.9
Nondurable manufacturing	1.35	1.42	1.39	1.96	2.12	2.17	1.1	0.2	1.0
Transportation	8.20	7.98	6.08	5.92	5.01	4.21	-1.2	-1.7	-1.3
Communications	4.34	5.12	6.14	6.39	7.15	6.77	1.2	-0.6	0.9
Public utilities	5.75	19.54	18.09	20.50	17.60	16.35	0.3	-0.7	0.1
Wholesale trade	0.35	0.44	0.59	0.83	1.29	1.35	3.3	0.4	2.7
Retail trade	0.75	0.83	0.83	1.01	1.12	1.30	1.0	1.5	1.1
Finance, insurance, real estate	6.14	4.96	4.84	5.58	5.60	5.06	-0.2	-1.0	-0.4
Services	0.77	0.86	0.81	0.89	0.71	0.61	-0.2	-1.6	-0.5
Total private	2.04	2.20	2.01	2.44	2.37	2.15	0.4	-1.0	0.1
Coefficient of variation	1.77	1.90	2.00	1.68	1.68	1.72			

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*Note:* Calculations are for the private sector only. Figures for the capital-labor ratio are in thousands of 1992 dollars per worker. The organic composition of capital of sector  $j$  is given by  $j = p_k K_j / w L_j$ . The coefficient of variation is based on 55 industries.

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**Table 6**  
**Decomposition of Changes in the Capital-Labor Ratio, Organic Composition,**  
**And Rate of Profit By Period, 1947-1997**

	1947- 1957	1957- 1967	1967- 1977	1977- 1987	1987- 1997	1947- 1997
<b>A. Capital-Labor Ratio <sup>a</sup></b>						
Actual Change:	9.3	10.2	10.5	6.5	2.7	39.2
Contribution of:						
Change in sectoral $j$	13.0	19.2	13.5	17.0	12.1	84.4
Employment shift ( $s_j$ )	-3.6	-9.0	-4.9	-10.5	-9.4	-45.1
<b>B. Organic Composition of Capital <sup>b</sup></b>						
Actual Change:	0.16	-0.20	0.43	-0.06	-0.23	0.11
Contribution of:						
Change in sectoral $j$	0.32	0.15	0.40	0.27	-0.18	1.10
Employment shift ( $s_j$ )	-0.15	-0.35	0.02	-0.34	-0.04	-0.99
<b>C. Net Rate of Profit <sup>c</sup></b>						
Actual Change (% points):	-2.4	1.7	-4.3	-0.2	3.7	-1.5
Percentage point contribution:						
Change in profits/wages	-0.9	-0.1	-0.9	-0.6	2.0	-0.5
Change in sectoral $j$	-2.9	-1.4	-3.2	-1.8	1.4	-10.4
Employment shift ( $s_j$ )	1.4	3.1	-0.2	2.2	0.3	9.4
<b>D. Gross Rate of Profit <sup>c</sup></b>						
Actual Change (% points)	-0.1	2.9	-5.6	2.3	3.4	3.0
Percentage point contribution:						
Change in profits/wages	1.8	0.5	-0.8	1.7	0.8	4.3
Change in sectoral $j$	-3.7	-1.9	-4.5	-2.7	2.	-13.8
Employment shift ( $s_j$ )	1.8	4.3	-0.3	3.3	0.5	12.5

*Note:* Calculations are for the private sector only.

a. In thousands of 1992 dollars per PEP. See equation (15) for decomposition.

b. See equation (16) for decomposition.

c. Net rate of profit = (PTI-CCCA-NCCA) / NETK; the gross rate of profit = PTI / NETK. The decomposition is based on equations (8) and (16).



**Table 7**  
**Summary Table of Factors Affecting the Change in the Rate of Profit**  
**Over Three Periods: 1947-1965, 1965-1982, and 1982-1997**

	1947- 1965	1965- 1982	1982- 1997
<b>A. Net Profits</b>			
Change in net rate of profit [% points]	0.7	-8.2	6.0
Change in net profit share [% points]	0.2	-3.7	2.9
Change in organic composition	-0.04	0.70	-0.55
Annual growth in net labor productivity less real wages [percent per annum]	-0.18	0.21	0.52
<b>B. Gross Profits</b>			
Change in gross rate of profit [% points]	4.3	-8.5	7.2
Change in gross profit share [% points]	3.1	-1.0	1.6
Change in organic composition	-0.04	0.70	-0.55
Annual percentage growth in gross labor productivity less real wages [percent per annum]	0.07	0.41	0.42
<b>C. Technological and Structural Effects</b>			
Annual percentage change in CPI/GDP deflator	-0.20	0.41	0.42
Annual percentage growth in capital/labor ratio	2.38	1.83	0.30
(i) With fixed industry employment shares	3.49	2.61	1.33
(ii) Difference	1.11	0.78	1.03
Annual percentage change in the price of capital goods relative to nominal wages ( $p_k/w$ )	-2.50	-0.05	-1.83

Key:

Net rate of profit =  $(PTI - CCCA - NCCA) / NETK$

Net profit share =  $(PTI - CCCA - NCCA) / NNI$

Net labor productivity =  $NNI (1992\$) / PEP$

Real wage =  $[(COMP + PI * .5) / CPI] / PEP$

Gross rate of profit =  $PTI / NETK$

Gross profit share =  $PTI / GNI$

Gross labor productivity =  $GNI (1992\$) / PEP$

Figure 1. Annual Percentage Change in the Corporate Profit Rate  
 And the Annual Percentage Change in the S&P 500, deflated to 1995\$, 1950-1997

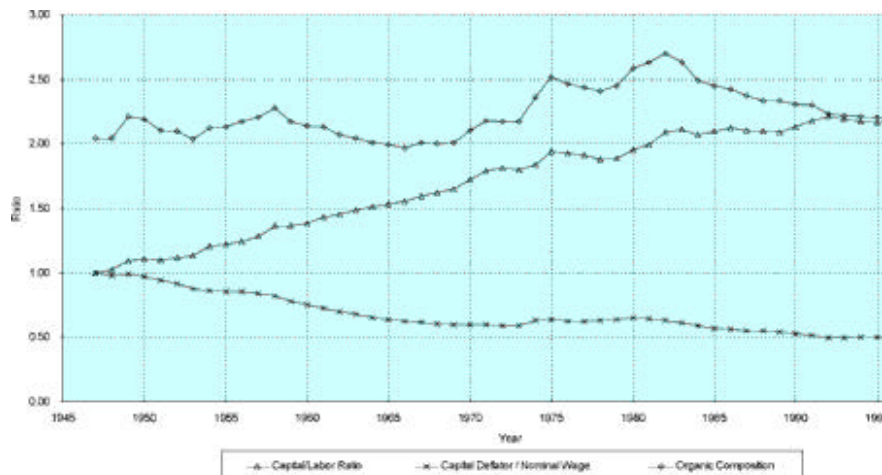


Figure 2. Trends in the Rate of Profit, 1947-1997

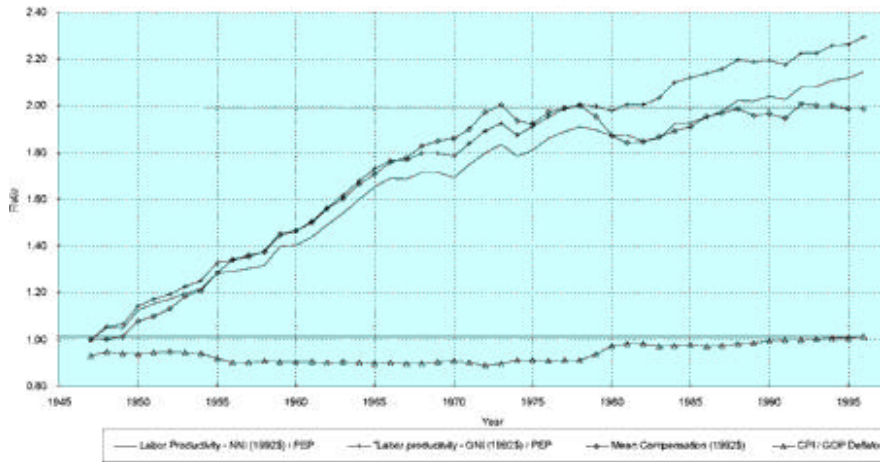


Figure 3. Trends in the Profit Share, 1947-1997

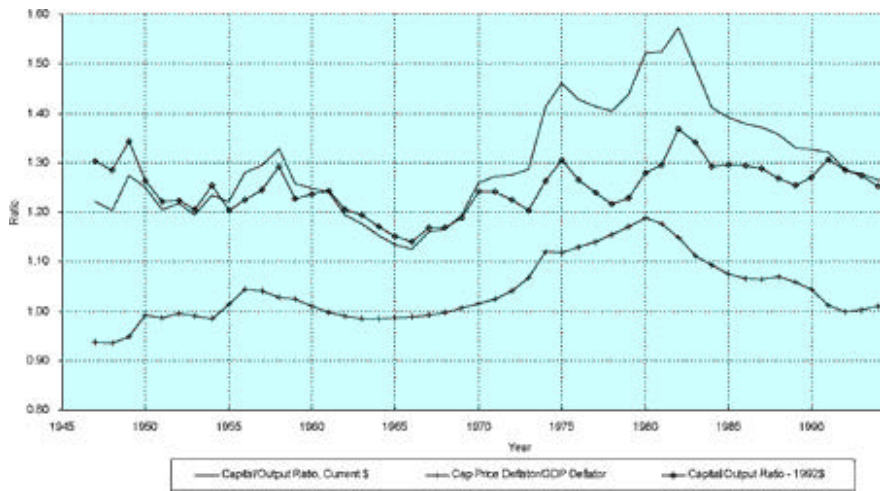


Figure 4. Capital-Output Ratios and the Capital Price Deflator Relative to the GDP Deflator, 1947-1997

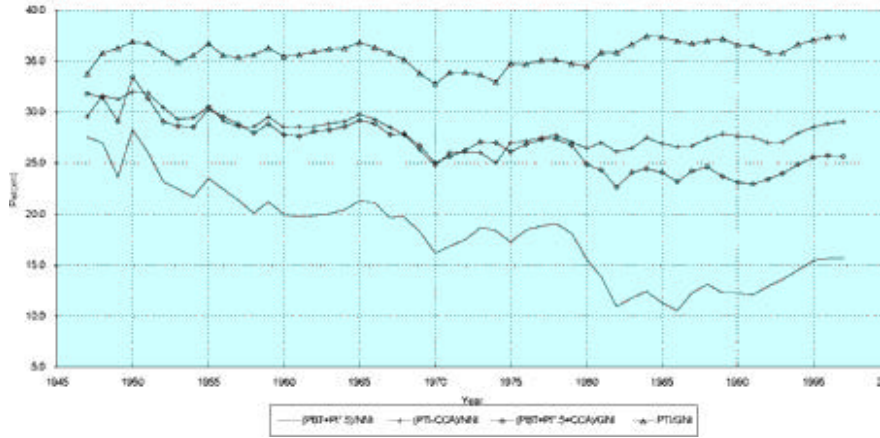


Figure 5. Labor Productivity, Mean Compensation, and The CPI Relative to the GDP Deflator, 1947-1997

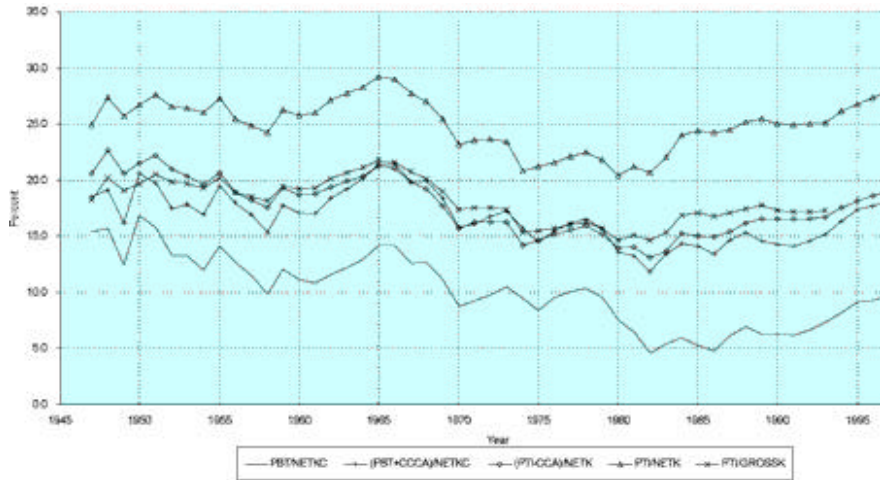


Figure 6. Capital-Labor Ratio and the Organic Composition of Capital, 1947-1997

