# Has Long-Run Profitability Risen In the 1990s?

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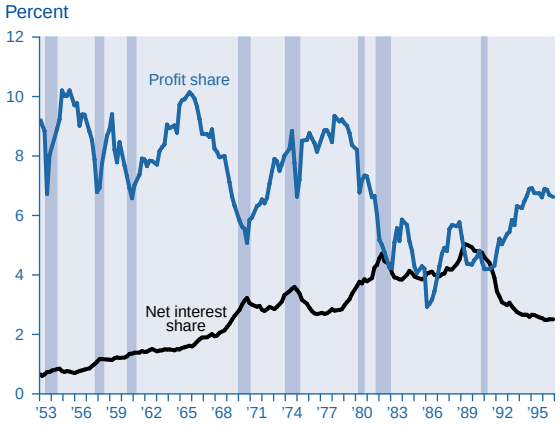
*This article analyzes the underlying sources of the recent rebound in corporate profits. Contrary to popular perception, virtually all of the resurgence in corporate profitability during the 1990s reflects a cyclical increase in profits and a decline in net interest expense associated with deleveraging and lower interest rates.*

After fluctuating in a high range during the 1960s and 1970s, the profit share (the ratio of after-tax profits to output) of nonfinancial corporations moved within a lower range through the early 1990s. In recent years, this measure of profitability has rebounded somewhat (*Figure 1*), largely owing to strong growth in corporate profits, which has both buoyed optimism about the long-run prospects for American companies—partly reflected by rising stock prices—and spurred criticism that companies have profited at the expense of workers (Bernstein 1995).

Whether the recent improvement is permanent or transitory is important for several reasons. First, profitability affects the financial strength of firms and has implications for their ability to weather downturns. Second, because retained earnings bolster investment, the permanence or impermanence of the recent improvement will have implications for investment and thus the long-run growth of the U.S. economy.[1] Finally, profitability is a key determinant of stock prices, which are important not only because they are indicators of future economic growth but also because they affect wealth and, thereby, consumption and investment.[2]

This article analyzes the underlying sources of the recent rebound in corporate profits. Contrary to popular perception, virtually all of the resurgence in corporate profitability during the 1990s reflects a cyclical increase in profits and a decline in net interest expense associated with deleveraging and lower interest rates. In other

Figure 1
After-Tax Profit and Net Interest Shares of U.S. Nonfinancial Corporations, 1953–96




NOTES: Break-adjusted for revisions associated with the shift to chain-weight GDP for the post-1958 period. The shaded areas denote recessions.

SOURCE: U.S. Bureau of Economic Analysis.

words, aside from cyclical movements in profitability, much of the recent improvement in profit share reflects the compositional effects of a shift in capital payments away from debtholders toward equityholders.

To establish these findings, the next section lays out a basic model of corporate profits, describing ways of adjusting profits for swings in net interest, the business cycle, oil prices, exchange rates, and government regulatory actions. The following sections discuss how corporate profitability and its determinants are measured and included in this model, and present empirical results and corporate profit measures adjusted for the aforementioned factors. The conclusion interprets the findings and discusses their implications.

## What determines profitability?

Profits equal revenues minus costs, where revenues equal the product of prices ($P$) and the quantity of output ($Y$). Costs include nominal fixed costs ($PF$), which equal prices ($P$) times real or inflation-adjusted fixed costs ($F$); labor costs ($WL$), which equal compensation per hour ($W$) times work hours ($L$); nonlabor variable costs ($vPY$), which equal real variable costs per unit of output ($v < 1$) times prices ($P$) and real output ($Y$); depreciation of capital in nominal dollars ($D$); and net interest payments in nominal dollars ($I$) to debtholders. In the long-run, if the capital–labor ratio is fairly stable, hours worked generally move one-for-one with output after adjusting for trend productivity growth. Additionally, if real compensation moves one-for-one with labor productivity, then labor costs ($WL$) are a constant share ($w < 1$) of nominal output ($PY$).[3] Combining these details, the level of nominal profits ($\Pi$) can be expressed as:

$$(1)\quad \Pi = (PY) - PF - (wPY) - (vPY) - D - I$$
$$= (PY) - PF - \{[w + v]PY\} - D - I,$$

where $w + v < 1$ (otherwise profits would be negative). Dividing both sides by nominal output ($PY$) yields an expression for profits as a share of output:

$$(2)\quad \pi = [1 - (w + v)] - F/Y - D/PY - I/PY,$$

where the profit share $\pi = \Pi/PY$ and $[1 - (w + v)] < 1$. The term $[1 - (w + v)]$ reflects the pricing power of firms because it depends on the extent to which prices exceed average, short-run variable costs. The pricing power of firms falls the greater the degree of competition, either from internal sources—which could stem from deregulation—or from foreign firms—which could stem from a rise in the real foreign exchange value of the dollar. Equation 2 indicates that four factors affect profitability: cyclical, relative price, depreciation, and net interest effects.

Cyclical factors. As real output growth picks up or as the economy operates at a higher level of capacity, the profit ratio should rise as real fixed costs ($F$) shrink as a share of output ($Y$) and if pricing power varies with the business cycle. Intuitively, profits tend to rise relative to output during economic recoveries and expansions, because fixed costs are spread over more output and perhaps also because producers may enjoy higher average profit margins when demand is high. Since the level of fixed costs other than depreciation is difficult to measure—in contrast to production—we can only readily control for output-related swings in the aggregate income share of fixed costs and in overall profit margins. Such cyclical swings are taken into account by including economywide measures of output growth and capacity.

Relative price factors. Relative prices can affect profits by altering the pricing power of domestic firms and by affecting how other costs vary with output. Swings in real exchange rates can alter the profit margins of U.S. firms by changing the relative competitiveness of foreign products. For example, when the foreign exchange value of the dollar jumped in the mid-1980s, many U.S. firms that produced traded goods saw the demand for their products decline because the high dollar made U.S. exports more expensive overseas and imports less expensive relative to U.S.-made goods to Americans in dollars. As a result, U.S. manufacturers experienced sharp declines in profits as demand for their output fell, reducing their pricing power and profit margins.[4] In terms of equation 2, this relative price change affects the extent to which prices exceed variable costs, as reflected in the term $[1 - (w + v)]$.

Another important relative price is the real price of energy, which affects energy-using and energy-producing firms in different ways. The change in, rather than the level of, energy prices is used because profits are more affected by sudden changes in energy prices than by their level for two reasons. First, when oil prices rise, profits fall at energy-intensive firms because it takes time for them to pass higher input costs to their customers and because their production efficiency will decline until they can shift toward using more energy-efficient equipment

and practices. In terms of equation 2, this effect raises the variable cost of output ($v$). Second, the profitability of energy producers to some degree reflects capital gains or losses on inventories and reserves stemming from changes in oil prices. For example, following a jump in oil prices, the energy-producing firms will book the one-time capital gains on their oil holdings as profits. It is thus unclear whether the negative impact of higher energy prices on profits at energy-using firms theoretically outweighs the positive impact of higher energy prices on energy industry profits in practice. This empirical issue is relevant since most high-energy-using firms and oil firms are nonfinancial corporations. Because cyclical variables are taken into account, the inclusion of energy price changes allows us to assess, after controlling for the impact of energy on the business cycle, whether profits tend to be higher or lower during recessions induced by rising oil prices.

Depreciation. According to equation 2, profit share should be negatively related to the depreciation ratio ($D/PY$), which largely reflects the obsolescence of prior investment.

Net interest. A higher net interest ratio ($I/PY$) also lowers the profit ratio. Net interest would rise if firms borrow more to finance inventories, if real interest rates rise, or if firms shift from equity to debt financing.[5] As for the last factor, the shift from equity to debt in the 1980s and its reversal in the 1990s first lowered and then boosted the profit ratio because the profit ratio reflects equity returns and the net interest ratio reflects debtholder returns.

Inflation. One omitted variable from this model is inflation. Public finance economists, such as Feldstein and Summers (1983), have argued that inflation hurts profits because many tax code provisions are not indexed for inflation. For example, higher inflation reduces firms' ability to depreciate capital for tax purposes because the nominal price of replacing older capital rises with inflation, whereas the tax write-offs for depreciation do not.

## Data and variables

This section describes how the dependent and independent variables are constructed. The profits, net interest, and depreciation variables are based on data from the national income and product accounts for nonfinancial corporations, as financial corporate profits are sometimes distorted by short-run shocks (for example, weather-related insurance costs) or swings in securities prices associated with unexpected developments (for example, changes in interest rates or when banks or thrifts book past loan losses or capital gains). The other variables fall into four categories: cyclical, relative price, regulation, and inflation. Many variables are from related work by Duca and VanHoose (1996 and forthcoming).

Profit share. The dependent variable is the after-tax profit share ($PRAT$) of nonfinancial corporate output.[6] An income share approach to measuring profitability is used because of difficulties in measuring the rate of return on capital, as discussed in the box entitled "Measuring Profitability: Income Share Versus Rate of Return Approach." After-tax, rather than before-tax profits, are used to assess profitability from a long-term perspective primarily because of large, long-term shifts in direct corporate taxation (see the box entitled "Should Profitability Be Measured on a Before- or After-Tax Basis?"). The dependent variable excludes net interest in its numerator, and net interest enters the model as a right-side variable because of tax and other differences (see the box entitled "Net Interest: A Component or Determinant of Profitability?").

Depreciation. The depreciation ratio ($D/PY$) in equation 2 is measured by the ratio of consumption of fixed capital to output ($DEPRAT$).

Net interest. The net interest ratio equals the ratio of net interest payments to output ($INTRAT$).

Cyclical variables. To control for cyclical effects, the models include the $t$ through $t$-3 lags of real GDP growth ($GDP$, $GDP1$, $GDP2$, and $GDP3$, respectively) and the four-quarter lag of year-over-year GDP growth ($GDPyoy4$).[7] The latter controls for medium-term effects of economic growth, while using fewer degrees of freedom than would be the case if one used four more lags of quarterly GDP growth. In addition, the current and one-quarter lag of the unemployment rate ($U_t$ and $U_{t-1}$, respectively) are included to control for the effects of capacity on profits discussed above.[8] Both types of variables are included because fast GDP growth in the early stage of recovery from a deep recession may not adequately reflect that the level of fixed costs is high relative to output, which may not have fully recovered from that recession.

Relative price terms. Two types of relative price terms, real exchange rates and real oil prices, may have large effects on aggregate profit measures. Real exchange rates, denoted by $RER$, are measured using the Federal Reserve Board's series on the real trade-weighted value

## Measuring Profitability: Income Share Versus Rate of Return Approach

Profitability can be measured using an income share or rate of return approach. The former approach measures profits as a share of output, whereas the latter expresses profits divided by the stock of capital. Each approach has relative strengths and weaknesses.

In theory, the rate of return approach seems preferable. If returns and capital invested can be accurately measured, then one can infer the rate of return. In such a case, a rate of return measure is superior to an income share variable because, in principle, the return on capital can change even if the income share is constant. For example, if capital were used more efficiently (that is, earned more per unit) and less were invested, then the income share of capital could be unchanged or fall, even though the return to capital has actually risen.

However, in practice, the income share approach has two advantages over rate of return measures. First, official capital stock measures for nonfinancial firms are available only on an annual basis, whereas quarterly income share variables are available.[1] The extra degrees of freedom (almost fourfold greater) allow for more rigorous and complete hypothesis testing. Second, there are a number of practical difficulties in accurately measuring the capital stock. For example, if an economic rather than a historical book-value approach to depreciation is used, the capital stock could plummet if the value of some capital were quickly written off based on shifting asset prices. Indeed, the value of structures in the nonfinancial corporate sector plunged in the early 1990s when government statisticians used market price data to downwardly adjust office building values, even though vacancy rates in the early 1990s and mid-1980s were similar. Because profits are measured contemporaneously, whereas the capital stock reflects previous investment and depreciation, the measured return on capital in the mid-1990s looks high largely because the measured rate of return jumped after the stock of office buildings was largely written off. However, it is difficult to construct a rate of return measure that tracks the value of the capital originally invested without distortions from large and uneven write-offs or capital gains.

Another source of measurement error arises with the shift from physical capital to human capital, the latter of which is more difficult to measure. For example, companies that invest much in research and development (R&D) by hiring scientists and engineers will appear to be less capital intensive than they really are according to a measure of the physical capital stock. Since investment is increasingly done in the form of R&D, conventional measures may overstate the real rate of return on capital by understating the stock of physical plus human capital. Thus, while measuring human capital raises problems for the rate of return and income share measures of profitability, they likely pose more difficulty for the rate of return approach.

Overall, practical considerations favor using an income share approach, which necessitates using data from the national income and product accounts. Table B.1 summarizes categories from these accounts and relates them to variables used in this article.

[1] In contrast, Nordhaus (1974) and Feldstein and Summers (1977) use annual rate of return data that provide few degrees of freedom and limit hypothesis testing.

### Table B.1
### Nonfinancial Corporate Business Data

This table summarizes the national income and product accounts (NIPA) of the nonfinancial business sector and relates NIPA categories to the variables used in the empirical model.

| NIPA category | How this category affects variables in the model | 1996:4 level in billions of dollars |
|---|---|---|
| 1. Gross domestic product of nonfinancial corporate business* (= lines 2+3) | Used as the denominator of *PRAT*, *DEPRAT*, and *INTRAT* | 4194.8 |
| 2. Consumption of fixed capital | Used as the numerator of the depreciation share, *DEPRAT* | 401.6 |
| 3. Net domestic product (= lines 4+5+6+12) | | 3793.2 |
| 4. Indirect taxes and net transfers | | 415.2 |
| 5. Compensation of employees | | 2788.2 |
| 6. Corporate profits with inventory valuation and capital-consumption adjustment (= lines 7+8+9+10+11) | | 484.5 |
| 7. Profits before tax | | 425.9 |
| 8. Profits tax liability | | 148.1 |
| 9. Profits after tax | Used in the numerator of *PRAT* | 277.8 |
| 10. Inventory-valuation adjustment | | –9.2 |
| 11. Capital-consumption adjustment | | 67.8 |
| 12. Net interest | Used in the numerator of *INTRAT* | 105.2 |

* Note that the cyclical variables *GDP* and *GDPyoy* in the model differ in that they are based on GDP data for all businesses (not just nonfinancial corporations) and are real, not nominal.

## Should Profitability Be Measured on a Before- or After-Tax Basis?

Another measurement issue is whether to use before- or after-tax profits in defining profitability. On the one hand, there are two reasons for using before-tax profits. First, because net interest is measured on a before-tax basis in the national income and product accounts, to be consistent, so should profits. Second, in the short run, sluggish adjustment to swings in corporate taxation could actually result in before-tax profit ratios being less volatile than after-tax ratios, which may absorb the short-run impact of tax changes (see Feldstein and Summers 1977). On the other hand, in the long run, shifts in direct corporate taxation will distort before-tax profitability but not after-tax profitability because competition will eventually force companies to pass on the changing costs of taxation to their customers and to yield an equilibrium after-tax return to investors. This issue is important because direct corporate taxation has substantially fallen as a share of nonfinancial corporate output, from roughly 7 percent in the 1960s to 5 percent in the 1970s and to 3 percent in the 1980s and 1990s.[1] More recently, tax changes passed in 1993 (specifically, the alternative minimum corporate profits tax) increased this tax burden some, putting pressure on firms to boost before-tax earnings to maintain after-tax earnings for investors. Given the significance of these changes and because the analysis focuses on long-run, rather than short-run, movements in profitability, the ratio of after-tax profits to output (*PRAT*) is used to assess whether there is a substantial and lasting rise in profit share under way.

[1] Auerbach and Poterba (1987) discuss tax code changes affecting corporations.

of the dollar, which is based on exchange rates and consumer prices of the G–10 countries.[9] Although there are broader measures of the real value of the dollar, this one is used because it is available over a longer sample period. Before 1968:1, when this series starts, *RER* equals the 1968:1 level. This useful assumption, which allows the regressions to start in the 1950s, is reasonable on two grounds. First, the real value of the dollar likely stayed in a narrow range over this earlier period, as exchange rates were fixed and inflation was low in the G–10 countries. Second, the inclusion of *RER* is economically significant largely because of the dollar's big rise and fall during the 1980s, which caused sizable swings in the profitability of traded-goods industries. Because exchange rates affect traded-goods prices with a lag, they often affect domestic profits with a lag. Accordingly, the model includes the one- through four-quarter lags of *RER* (denoted as *RER1*, *RER2*, *RER3*, and *RER4*, respectively).

The other relative price term is the change in the real price of energy ($\Delta OIL$), which controls for swings in energy prices. To distinguish the relative price from the cyclical effects of changing energy prices, the models include the $t$ through $t$-3 lags of $\Delta OIL$ and the four-quarter lag of the year-over-year change in real energy prices ($\Delta OILyoy4$). The real consumer price is used because the impact of price controls on wholesale and retail energy prices differed at

## Net Interest: A Component or Determinant of Profitability?

A third measurement issue concerns profits and net interest. At one level, both profits and net interest are factor payments to capital, implying that profitability should be based on their sum, as in Feldstein and Summers (1977). Indeed, the large shift from equity to debt in the 1980s implies that the profits were lowered then simply because of a shift from one form of capital to another. The high degree of substitutability of debt and equity in the 1980s is further supported by the fact that much of the buildup in the 1980s in corporate debt reflected stock repurchases and the issuance by highly leveraged firms of lower grade bonds, whose risk profiles some analysts viewed as more like equity than traditional high-grade bonds. The subsequent deleveraging of the 1990s bolstered profits and lowered net interest, as illustrated in Figure 1.

However, debt and equity are not perfect substitutes. For example, net interest was temporarily boosted in the 1974–75 inventory-related recession, when firms borrowed more to finance unintended inventory buildups. In addition, the adoption of lean inventory techniques in the 1990s likely has reduced the cost of financing inventories. Hence, some of the past swings in the net interest reflect swings or shifts in (inventory) costs that negatively affect the economic returns to capital. Net interest payments also reflect swings in real interest rates associated with fiscal policy and/or monetary policy, such as the short-lived jumps during 1981–82 and 1989–90. In addition, movements in net interest may also reflect how swings in inflation affect corporate debt payments relative to income. For example, the net interest ratio may have been bolstered in the 1981–83 period when rapid and somewhat unanticipated disinflation slowed the growth of nominal corporate revenues relative to the high interest rates on existing bonds that some corporations had issued during the high inflation of the late 1970s and early 1980s. The net interest and profit measures used here also differ in that profits are measured on an after-tax basis, whereas net interest is measured on a before-tax basis. For these reasons, it may not be appropriate to simply add net interest and after-tax profits to measure the return to capital.[1]

Nevertheless, shifts in debt and equity financing imply that the analysis needs to control for movements in net interest. With these considerations in mind, the ratio of net interest payments to output (*INTRAT*) enters as a right-side variable. The more that debt and equity are substitutes, the closer the coefficient on the net interest ratio should be to 1.

[1] While adding net interest to before-tax profits avoids this problem, shifts in corporate taxation make it preferable to use after-tax profit share in analyzing long-run profitability.

times, energy industry profits moved more closely with consumer prices, and the speed at which consumer energy prices react to wholesale energy prices has changed. From 1957 to 1996, the real price of energy is the ratio of CPI energy prices to the CPI. Before 1957, real energy prices are measured by the ratio of the energy prices in the personal consumption expenditures (PCE) deflator to the overall PCE deflator, where overlapping ratios based on the CPI and PCE in 1957:1 are used to break adjust the two series.

Regulatory variables. Because equation 2 omits potentially significant regulatory or tax actions, the empirical model assesses profit fluctuations stemming from two unusual government actions. One dummy, $D534$ (= 1 in 1953:4), controls for the one-time plunge in profits during 1953:4. Firms booked profits out of that quarter because it was announced in September 1953 that an excess-profits tax from the Korean War would end in January 1954. Variables for subsequent quarters are not needed because firms apparently booked 1953 profits over several subsequent quarters, making it difficult to construct dummy variables for the "payback" effects.

Dummy variables are also tested to account for the Nixon wage–price controls, during which period price controls affected profit margins. Specifically, many firms were allowed to increase prices in response to cost increases only to the extent that their average profit margins did not exceed the average of the 1969–70 period. However, profit margins tend to be low during recessions, such as in the 1969–70 recession. Thus, the price controls effectively capped profit margins at low recessionary levels and delayed a cyclical recovery in profits (see *Economic Report of the President*, 1974, 91, and 1973, 65, respectively).[10] Nine separate dummy variables are used for each quarter when the controls were in effect (1971:4–73:4, denoted $D714$–$D734$) because a single dummy for 1971:4–73:4 will not reflect how the different phases of the controls and their ability to bind changed in this economic recovery.[11]

Inflation. To assess the impact of inflation on profitability, two inflation terms are tested: the year-over-year CPI inflation rate ($INFyoy$) and the four-quarter lag of this inflation measure ($INFyoy4$). Year-over-year measures are used because inflation may show some short-run persistence, whereas including eight separate quarterly lags instead would use up many degrees of freedom and make it difficult to observe any persistent and significant effects of inflation.

## Results

Empirical model. Based on equation 2 and the discussion of possible regulatory and inflation effects on profits, the baseline empirical model used is

$$
\begin{aligned}
PRAT = {} & \text{constant} + \delta_1 DEPRAT + \delta_2 INTRAT \\
& + \sum_{i=0}^{3} \alpha_i GDP_{t-i} + \alpha_4 GDPyoy4 \\
& + \beta_0 U_t + \beta_1 U_{t-1} \qquad \text{(cyclical variables)} \\
& + \sum_{i=0}^{3} \gamma_i \Delta OIL_{t-i} + \gamma_4 \Delta OILyoy4 \\
& \qquad \text{(relative energy price variables)} \\
& + \sum_{i=1}^{4} \zeta_i RER_{t-i} \qquad \text{(real exchange variable)} \\
& + \phi D534_t \qquad \text{(regulatory variable),}
\end{aligned}
$$

where Greek letters denote estimated coefficients. The baseline model excludes the inflation and Nixon wage–price dummy variables, as both are statistically insignificant. As a check that potential simultaneity bias is not altering the basic qualitative results, a version of the baseline model is also used, which replaces contemporaneous $DEPRAT$ and $INTRAT$ with their one-quarter lags, drops contemporaneous $GDP$ and $\Delta OIL$, and drops $U_t$ but adds the two-quarter lag of $U$. Although some of the newly lagged right-side variables became statistically insignificant, the long-run trends in profitability are similar when profits are adjusted for the estimated effects of swings in the business cycle, oil prices, and exchange rates. Results from models with nonlagged variables are provided because profits are very sensitive to economic developments, and fits of models using contemporaneous values are better than those using lagged variables.

Regression results. Regression results are presented in Table 1, in which models 1 and 2 include time-trend variables, unlike models 3 and 4, and in which models 2 and 4 include inflation terms, unlike models 1 and 3. As this table indicates, the after-tax profit ratio is very sensitive to the business cycle in every model. Faster GDP growth boosts the profit ratio, as does a lower unemployment rate, which reflects tighter capacity. The negative sign on $U_t$ and the positive sign on $U_{t-1}$ reflect that profits are reduced by the current level of and change in the unemployment rate. From a technical perspective, the negative sum of the coefficients on the $U$ lags reflects the negative effect of a lower *level* of capacity on profits, while the positive sign on the one-quarter lag actually reflects the negative effect of a *decrease* in capacity.[12]

Turning to relative price effects, positive

Table 1

## Regression Results for Models of After-Tax Profit Share

| Variable | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| constant | .167** | .160** | .167** | .159** | .168** |
| | (9.54) | (8.92) | (9.34) | (8.40) | (9.30) |
| *INTRAT* | –.804** | –.750** | –.807** | –.753** | –.767** |
| | (–4.17) | (–3.92) | (–3.95) | (–3.65) | (–3.76) |
| *DEPRAT* | –.248* | –.306** | –.247* | –.302** | –.248* |
| | (–2.16) | (–2.66) | (–2.15) | (–2.62) | (–2.15) |
| *GDP* | .163** | .157** | .160** | .155** | .162** |
| | (5.09) | (4.95) | (4.99) | (4.88) | (5.05) |
| *GDP1* | .136* | .129** | .134** | .129** | .133** |
| | (4.02) | (3.79) | (3.91) | (3.72) | (3.85) |
| *GDP2* | .094** | .086* | .097** | .090* | .090* |
| | (2.64) | (2.39) | (2.64) | (2.42) | (2.49) |
| *GDP3* | .093** | .085* | .098** | .092** | .091** |
| | (2.83) | (2.56) | (2.92) | (2.66) | (2.73) |
| *GDPyoy4* | .042$^{+}$ | .038$^{+}$ | .051* | .047* | .042$^{+}$ |
| | (1.92) | (1.70) | (2.18) | (1.98) | (1.90) |
| $U_t$ | –.0032** | –.0032** | –.0033** | –.0033** | –.0032** |
| | (–3.16) | (–3.24) | (–3.21) | (–3.29) | (–3.14) |
| $U_{t-1}$ | .0024** | .0024** | .0024* | .0023* | .0023* |
| | (2.65) | (2.62) | (2.47) | (2.46) | (2.39) |
| $\Delta OIL$ | .032** | .031** | .033** | .032** | .034** |
| | (2.88) | (2.86) | (2.75) | (2.70) | (2.88) |
| $\Delta OIL1$ | .025* | .023$^{+}$ | .026* | .024$^{+}$ | .027* |
| | (2.04) | (1.89) | (2.01) | (1.86) | (2.09) |
| $\Delta OIL2$ | .058** | .055** | .059** | .056** | .062** |
| | (4.21) | (4.00) | (3.75) | (3.57) | (3.93) |
| $\Delta OIL3$ | .042** | .039** | .042** | .038* | .046** |
| | (3.17) | (2.86) | (2.73) | (2.47) | (3.01) |
| $\Delta OILyoy4$ | .026* | .024* | .021$^{+}$ | .019 | .027$^{+}$ |
| | (2.56) | (2.36) | (1.76) | (1.58) | (2.59) |
| *RER1* | –.0001 | –.0000 | –.0001 | –.0001 | –.0001 |
| | (–1.07) | (–.64) | (–1.18) | (–.77) | (–1.14) |
| *RER2* | –.0001 | –.0001 | –.0001 | –.0001 | –.0001 |
| | (–1.35) | (–1.04) | (–1.41) | (–1.11) | (–1.36) |
| *RER3* | .0000 | .0000 | .00003 | .0000 | .0000 |
| | (.17) | (.40) | (.30) | (.53) | (.15) |
| *RER4* | –.0003** | –.0002** | –.0003** | –.0002** | –.0003** |
| | (–3.67) | (–3.07) | (–3.54) | (–2.98) | (–3.68) |
| *D534* | –.016** | –.016** | –.016** | –.016** | –.016** |
| | (–7.32) | (–7.46) | (–7.26) | (–7.38) | (–7.33) |
| *t* | .00026 | | .00025 | | .00029 |
| | (1.31) | | (1.16) | | (1.38) |
| $t^2$ | –.0000017* | | –.0000016$^{+}$ | | –.0000018* |
| | (–2.19) | | (–1.93) | | (–2.19) |
| *INFyoy* | | | –.023 | –.019 | –.027 |
| | | | (–.48) | (–.38) | (–.55) |
| *INFyoy4* | | | .047 | .049 | |
| | | | (1.11) | (1.12) | |
| $\bar{R}^2$ | .978 | .977 | .978 | .977 | .978 |
| ρ | .876 | .952 | .877 | .952 | .882 |
| *D.W.* | 1.97 | 2.02 | 1.94 | 2.00 | 1.97 |
| *Q*(24) | 22.49 | 15.51 | 24.12 | 16.86 | 22.28 |
| $F(t,t^2)$ | 3.27** | | 3.23** | | 3.22** |
| *F*(*INFyoy,INFyoy4*) | | | .75 | .76 | |

**(*,$^{+}$) denotes statistical significance at the 99 percent (95 percent, 90 percent) confidence levels.

signs on $\Delta OILyoy4$ and lags of $\Delta OIL_{t-I}$ suggest that higher oil prices boost profits. However, higher oil prices also lower output and thereby profitability. For this reason, the energy coefficient estimates do not reflect that real oil price increases probably hurt profits by inducing recessions, effects that are picked up by the cyclical variables. For this reason, it is best to interpret the energy coefficients as indicating that once the negative cyclical impact of higher oil prices is taken into account, higher real oil prices tend to boost profits. Put another way, nonfinancial corporate profits have tended to fall less in oil-induced recessions than in non-oil-induced recessions, once the overall magnitude of the recessions is taken into account by cyclical variables. One plausible explanation is that, after controlling for cyclical effects, energy company profits are apparently bolstered by capital gains on oil reserves by more than profits of oil-using companies are reduced, most likely because oil companies book substantial capital gains on oil reserves in the former type of recession.

With respect to the other relative price variables, results also indicate that a real exchange rate appreciation lowers the profitability ratio with about a four-quarter lag, often through reducing the competitiveness of traded-goods industries. Because most of the statistical significance of the real exchange rate variable reflects the large hump in the dollar's value in the mid-1980s, and because subsequent movements in the dollar's value have been smaller in size, the effects of exchange rates may be less precisely estimated than the standard errors and $t$ ratios imply.

The estimated coefficients on the net interest ratio are worthy of more confidence, not only because net interest changes have occurred in several instances but also because the estimated coefficients are plausible. The fact that the coefficients are under 1 (roughly 0.8) for the after-tax profit share—coupled with results from other regressions (not shown), which indicate that the net interest ratio has a 1–1 effect on before-tax profit share—implies that after-tax profits and net interest are not perfect substitutes largely because of tax differences.

Results for regulatory variables are mixed. For example, the tax dummy for 1953:4 is always statistically and economically significant, indicating that the tax-cut announcement of 1953:4 cut the profit ratio by about 1.6 percentage points. On the other hand, the Nixon price-control dummy variables are jointly insignificant, as indicated by $F$ statistics testing the joint significance of these dummies in models corresponding to models 1–4.[13]

In contrast to the price-control variables, while the time terms ($t$ and $t^2$) are jointly significant, their inclusion does not alter the qualitative regression results, as is reflected in Table 1, and the general movement in the adjusted profit ratio (not shown).

Perhaps at odds with the public finance literature on inflation and corporate taxation, the inflation variable is statistically insignificant (see models 3–5). This result also arises using the shorter sample of 1953:1–79:4. In other runs that omit statistically significant energy price variables, inflation is significant but with a counter-intuitive positive sign. This result likely reflects that, in the absence of energy price variables, CPI inflation is spuriously picking up changes in real energy prices stemming from omitted variable bias. Another reason for the lack of a negative and significant effect of inflation on profit share may be that changes in the tax code (particularly in 1981 and 1986) render the effect of inflation uneven over long samples. As a result, it may be difficult to find a statistically significant effect of inflation on profits without adjusting for tax code changes in some way. In light of this plausible explanation, the findings indicate that inflation may not add information about the after-tax share of profits in the presence of cyclical and relative price terms and in the absence of accounting for tax code changes.

## Has the underlying trend in profits changed much?

Using the regression results, one can address the questions of whether and why the underlying trend in after-tax profit share has changed much in the 1990s. To do this, one can adjust profit share by subtracting from it the estimated impacts of the business cycle (GDP growth and unemployment rate effects), real oil prices, real exchange rates, regulatory variables, and swings in net interest. As shown in Figure 2, this adjusted profit ratio fell from the late 1970s to mid-1980s and since then has fluctuated in a range that is noticeably below that of prior decades.[14] Interestingly, the profit performance of the 1970s differs little from that of the 1950s and 1960s on an adjusted basis, in contrast to the unadjusted data. This difference mainly reflects that the cyclical performance of the 1970s in terms of GDP growth and unemployment was noticeably worse than that of the prior decades and that interest rates were higher as well.

Table 2
## Which Sectors Face Much Higher Competition Since the 1970s?

| *SIC Sector*[1] | *Major Changes Boosting Competition in Particular Industries* |
|---|---|
| **Agriculture** | ——— |
| **Mining** | *Oil & Gas:* Oil prices deregulated by a series of presidential executive orders beginning in 1979, and natural gas prices deregulated in phases by the Natural Gas Policy Act of 1978. |
| **Construction** | ——— |
| **Manufacturing** | Increased openness to trade, partly from GATT (1979, 1993), Canada–U.S. Free Trade Agreement (1989), and NAFTA (1994). |
| **Transportation** | *Trucking:* Liberalization of truck rates in the late 1970s and the Motor Carrier Reform Act (1980).<br>*Airlines:* The Airline Deregulation Act (1978) allowed entry in 1982 and deregulated air fares in 1983.<br>*Railroads:* Deregulated by ICC liberalization of rail rates in the late 1970s and the Staggers Rail Act (1981). |
| **Communications** | *Telephones:* Largely deregulated following the ATT court settlement of 1982.<br>*Cable Television:* Deregulated in a series of FCC rulings in the late 1970s and by the Cable Television Deregulation Act (1984).<br>*Telecommunications:* Partly deregulated by Telecommunications Act (1996). |
| **Utilities** | *Electricity:* Wholesale deregulation enhanced by Federal Energy Regulatory Commission rulings (1996). |
| **Wholesale** | ——— |
| **Retail** | *Department Stores:* Rise of discount store chains and electronic shopping. |
| **FIRE (Finance, Insurance and Real Estate)** | *Banking:* Partly deregulated by the Depository Institution Deregulation and Monetary Control Act (1980) and the Garn-St. Germain Depository Institutions Act (1982). |
| **Service** | *Health Care:* Innovations in the form of HMOs and managed care in the 1990s. |

[1] Standard Industry Classification (SIC) of sectors at the 1-digit-level classification code.

SOURCES: Winston (1993) and author's compilations.

With respect to the late 1980s through the mid-1990s, virtually all of the run-up in the unadjusted profit ratio is due to swings in the business cycle and net interest, as demonstrated by the flatness in the adjusted profit ratio plotted in Figure 2. Much of the unadjusted rise stems from a huge decline in net interest since the late 1980s, which may largely be a long-lasting effect if the deleveraging of the early 1990s does not reverse itself (and also if real interest rates do not trend higher from the levels of the mid-1990s).

To a large extent, swings in the use of leverage reflect changing risk assessments and the development of new financial markets. For example, the rise of leverage in the 1980s partly reflected the further development of the junk bond market, more optimistic assessments of the risk posed by increased leverage, and the increased use of debt to finance an increase in corporate takeovers and mergers. The subsequent deleveraging of the 1990s likely reflected, in part, how the unexpected recession and credit crunch of the early 1990s induced an upward reassessment of the risks of leverage and spurred a shift toward using stock swaps and relatively less debt to finance takeovers and mergers.

Because the impact of the recent net interest swing conceivably may persist for some time, whereas cyclical swings appear to be more short-lived, it is helpful to look at the after-tax profit share adjusted only for net interest effects, as shown in Figure 3.[15] Consistent with the plot of profit share adjusted for cyclical and net interest swings in Figure 2, the net interest-adjusted profit share has moved in a lower range since the mid-1980s. Indeed, recent readings are well below the high points reached in the later phases of prior business expansions, such as in 1955, 1958, 1966, and the late 1970s.

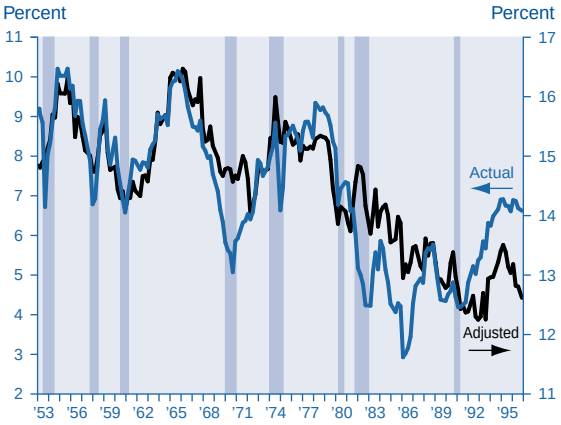
The fact that adjusted profits have moved in a lower range over the 1980s and 1990s raises the question, Why did profitability fall after the

1970s? One plausible, but unproven, explanation is that a number of factors have heightened the degree of competition facing firms. In turn, greater competition may have speeded up the pace of capital depreciation as firms more quickly replaced aging capital to match their competitors. This possible effect of greater competition may be reflected in the adjusted-profit ratio because the effect of depreciation was not subtracted from the raw-profit ratio in constructing the adjusted profit ratio in Figure 2. In addition, lower pricing power could arguably boost the shares of output going to other factors, such as variable costs, as firms extract less economic rent from other factors of production.[16]

What could have caused a rise in the degree of goods market competition since the 1970s? One often mentioned reason is heightened global competition. While trade flows imply that this should have been more of a factor in the 1970s, when the ratio of imports relative to GDP rose most prominently, import penetration during the 1970s may have induced U.S. firms to cut profit margins in the 1980s after losing market share in key traded-goods industries.

However, nontraded-goods industries have arguably become more competitive as well. For starters, a number of industries experienced greater competition stemming from deregulation in the late 1970s and early 1980s, including

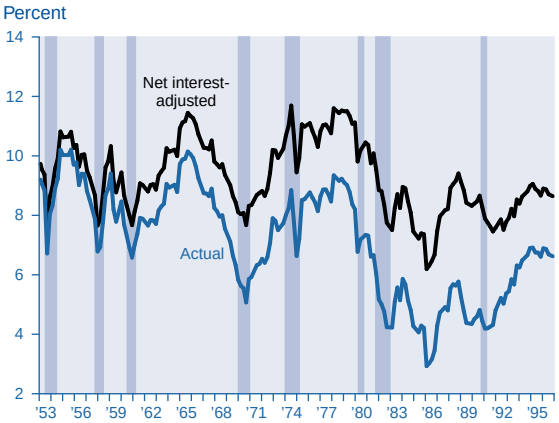
Figure 2
Adjusted and Actual After-Tax Profit Shares Of U.S. Nonfinancial Corporations, 1953–96




NOTES: The adjusted profit share equals the actual profit share minus the estimated effects of swings associated with the business cycle, the Korean War profits tax, real exchange rates, real oil prices, and net interest, as estimated by model 1 in Table 1. The shaded areas denote recessions.

SOURCES: U.S. Bureau of Economic Analysis and the author's calculations.

Figure 3
Adjusted and Net Interest-Adjusted After-Tax Profit Shares of U.S. Nonfinancial Corporations, 1953–96




NOTES: The net interest-adjusted profit share equals the actual profit share minus the estimated effects of swings associated with net interest, as estimated by model 1 in Table 1. The shaded areas denote recessions.

SOURCES: U.S. Bureau of Economic Analysis and author's calculations.

the trucking, railroad, telephone, and airline industries (*Table 2*). More recently, the development of new information technologies may have enhanced competition in the information processing industry and reduced the costs to customers of shopping for the lowest prices. In addition, the development of new health care delivery organizations and changing cultural attitudes have enabled health care restructuring to open up the medical industry to more price competition in the 1990s (see Frech 1996).[17]

It is not certain why the adjusted after-tax profit share has not recovered to the range of the 1950s–70s. Nevertheless, developments suggest that increased goods market competition has played a role. For example, anecdotal reports in Federal Reserve Beige books in the 1990s suggest that inflation has remained low, in part because intense goods market competition has made it difficult for firms to raise prices (see Duca and VanHoose 1996).

## Conclusion

This article finds that the rise in the after-tax profit share of nonfinancial corporations during the 1990s largely stems from a cyclical recovery in the U.S. economy and a decline in the net interest ratio often attributed to deleveraging and lower interest rates. In this sense, it is not clear that a long-lasting increase in the economic returns to capital has occurred, after accounting for the returns to debtholders

and equityholders and short-run, cyclical-related movements.

Although the financial strength of U.S. firms may not appear to have improved much based on the adjusted profit share variable, the deleveraging of the 1990s, as reflected in a lower net interest ratio, has improved the ability of firms to meet debt payments in the event of a downturn (see Bernanke, Campbell, and Whited 1990). Findings also suggest that much of the recent rise in the U.S. net investment rate owes less to a permanent jump in profitability and more to other potential factors, such as the business cycle, transitory rises in profits, or less crowding out of investment due to a lowering of the U.S. budget deficit. As for stock prices, the findings do not necessarily imply that stock prices are over- or undervalued, because profitability is only one of the three key determinants of equity values, the others being interest rates and risk preferences.[18]

Findings do, however, indicate that the after-tax profit share of nonfinancial corporations is not directly affected by inflation, although this result could stem from changes in the tax code, which may have altered the effect of inflation on profit share. Nevertheless, this finding does not necessarily imply that the *level* of profits is not hurt by inflation. In particular, low and stable inflation may indirectly boost the income going to each share of production, with factor income equaling a factor's income share multiplied by output. By creating an environment of stable and sustainable growth, boom–bust cycles in production are curtailed, which keeps output closer, on average, to its sustainable path and indirectly curtails cyclical swings in factor shares. Indeed, with respect to the former channel, growth and inflation have been smoother under the Federal Reserve's forward-looking low inflation policy in effect since the early 1980s.

## Notes

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1 See Meyer and Kuh (1957) and Fazzari, Hubbard, and Petersen (1988).

2 The Standard & Poor's 500-stock index is a component of the index of leading economic indicators, based on evidence that stock prices are indicators of future economic growth—for example, see Bosworth (1975) and Duffee and Prowse (1996). Stock market wealth has been shown to affect consumption (see Mishkin 1977) and is used in many econometric models of consumption and investment, such as those used by the Federal Reserve Board and DRI/McGraw-Hill.

3 When compensation is deflated by an overall price index for consumption and business goods, rather than simply for consumption goods, real labor costs trend with productivity, as shown in the 1996 *Economic Report of the President*, 60–61.

4 Several studies of how exchange rates affect traded goods, such as Mann (1986), have found a role for imperfect competition in which exchange rates and pricing power are related.

5 Crabbe, Pickering, and Prowse (1990) analyze the shift in the 1980s from equity to debt.

6 Profits exclude capital consumption and inventory-valuation adjustments. Results are similar using before-tax profits—see Duca and VanHoose (forthcoming).

To include as many business cycles in the sample as possible, the after-tax profit ratio was created by splicing two series: one based on data revisions associated with the shift to chain-weighted GDP data affecting data starting in 1959:1 and the other based on earlier data not affected by this rebenchmarking. Both real and nominal data on corporate profits before 1959 will be revised when pre-1959 estimates of real chain-weighted GDP are released. Using overlapping data over 1959:1–4, a break-adjustment ratio was calculated. Multiplying the earlier data by this ratio eliminates a small level shift between 1958:4 and 1959:1 when the two series are spliced together. A similar procedure was used to create break-adjusted series for the depreciation ratio (*DEPRAT*) and the net interest ratio (*NETINT*).

7 For values of GDP variables involving pre-1959 data, growth rates were based on 1987 GDP because pre-1959 chain-weighted GDP data are not available. This splicing was done to include as many business cycles as possible to help estimate cyclical effects.

8 By including both lags, the model effectively includes current unemployment and the change in unemployment. To control for the 1994 change in the employment survey, which boosted the unemployment rate by 0.2, 0.2 is added to the unemployment rate before 1994:1.

9 The G–10, or Group of Ten countries, includes Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, the United Kingdom, and the United States.

10 Gordon (1972, 411, Table 5, line 5e) estimates that the controls reduced the before-tax profit ratio by 1.25 percentage points for nonfinancial corporations over 1971:4–72:2.

11 By contrast, the Korean War wage and price controls did not limit price rises based on profit margins, were imposed in an expansion, and did not cap profit margins at recessionary levels. By stabilizing the gap between prices and costs at its prewar, expansionary

level, these controls stabilized profit margins at levels typical of an economic expansion. Hence, unlike the Nixon price controls, dummies for the Korean War price controls are not needed.

[12] Denoting the coefficients on $U_t$ and $U_{t-1}$ as $\beta_1$ and $\beta_2$, respectively, the unemployment effects can be reexpressed as $(\beta_1 - \beta_2)U_t + (\beta_2 U_t - \beta_2 U_{t-1}) \equiv (\beta_1 - \beta_2)U_t + \beta_2 \Delta U_t$.

[13] The controls had a larger, but still jointly insignificant, effect on before-tax profit share in regressions not reported in the tables. The coefficients on the control variables in these regressions indicate that the controls depressed the before-tax ratios by about 1.25 percentage points, near Gordon's (1972) estimate for the effects in the first three quarters. The inclusion of the price-control variables is qualitatively significant in the before-tax runs because it affects the estimated cyclical effects. Specifically, the unemployment rate variables are only marginally significant when one excludes the price-control dummy variables from the model but very significant otherwise. However, this result is not too surprising, given that there is good reason to believe that the controls forestalled a cyclical recovery in profit ratios in the early 1970s.

[14] Two different scales are used in Figure 2 because estimated effects of selected regressors reflect the means of these variables and because the model is estimated with a constant. For our purposes, it is the trend of adjusted profitability that matters.

[15] Unlike the trend in the income share of before-tax profits plus net interest, the trend in the share of after-tax profits adjusted for estimated net interest effects (shown here) is less susceptible to being distorted by the big declines in direct corporate taxation since the 1960s.

[16] Flatness in labor share suggests that the coefficient *w* in Equation 2 has not risen.

[17] For example, health maintenance organizations (HMOs) are less vulnerable to malpractice suits than traditional health providers and are thus more able to adopt cost-saving practices. The increase in health insurance premiums in the 1980s induced firms to curb medical costs. Given the sensitivities surrounding health care and time needed to reform practices, the rise of HMOs lagged this need. The impact of HMOs on corporate competition is limited to the extent that health services are delivered by proprietorships and partnerships.

[18] In theory, stock prices equal the present value of future earnings minus a "risk premium" to pay investors for risk, where the present value formula adjusts earnings for interest that could be earned from bonds. Thus, stock prices should rise when earnings' forecasts rise, interest rates decline, or risk premiums fall. The risk premium equals the price of the risk times the amount of risk, and seems to have declined since the 1970s (see Blanchard 1993). Aside from whether the price of risk has fallen, one explanation for the apparent decline of the risk premium is that the volatility of stock returns — a measure of risk — has dropped since the 1970s (see Davis and White 1987 and Hickok 1996). It is unclear whether the risk premium has fallen enough to justify equity prices, because it is hard to disentangle the market price of risk from the actual degree of investment risk and to accurately measure each of these elements.

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