How Much Did the Cost of Capital Decline? It Depends on When You Start Measuring It*

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Abstract

Recent literature documents a significant decline in the cost of capital and a respective rise in market power over the last 40 years. We show the magnitudes of these changes are sensitive to the sample start date: from 1981 to 2015 the change in economic profits is nearly $300 billion lower than from 1984 to 2014, the reference period frequently used in the literature. Specifically, we find that in 1984 the cost of capital was unusually but temporarily high. That is, extending the sample back by a few years lowers the magnitude of the changes in capital costs, capital shares, and profit by up to 30 percent. Consequently, the implied increase in markups over the last decades is not as pronounced as previously suggested.

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1 Introduction

Expanding literature documents the rise in corporate profits and the decline in the labor share of output. Barkai (2020) captures this fact best, finding that the capital share of output declined by 22% over the last 30 years, while the labor share declined by 11%. This change translates into an increase in economic profits of over \$1.2 trillion in 2014, or \$14.6 per U.S. worker. Barkai (2020) derives the increase in profit by decomposing aggregate factor income into labor and capital income and taking the residual as profit.

Measuring the increases in profits and markups are essential to estimating market power and founding antitrust policy. A long-term trend points to individual industries becoming more concentrated, with some showing increased profits and markups (Grullon et al., 2019; Hall, 2018; De Loecker et al., 2020). A review by Basu (2019) reconciles the current estimates of markups and profits from three existing approaches in the literature. Basu (2019) finds that economic profit rates estimated from an aggregate level, from production functions for a variety of inputs, and from production functions for a single input produce a wide range of estimates plausibly above and below Barkai (2020). First, the structure-conduct-performance approach of estimating markups at an aggregate level has been previously challenged within the field of industrial organization (Schmalensee, 1989), and while production function approaches offer more convincing evidence of increasing markups, the magnitudes remain somewhat unclear (Berry et al., 2019). In a review, Syverson (2019) suggests that current models and empirical approaches to measuring aggregate market power require more concrete evidence to make conclusions about rising market power. Our findings contribute to the ongoing debate about the magnitude of the decline in the cost of capital and the rise of profits. Most recently,Foster et al. (2022) find that using a production function approach the increase in markups, and by extension profits, over the last 40 years is substantially dampened for most industries and eliminated for manufacturing, attributed to an observable change in technology.

Precise measurements of profit rates and markups are necessary for welfare estimation and model calibration. First, increased profit rates can affect debt sustainability. In the 2019 AEA presidential address, Blanchard (2019) argues the average marginal product of capital has declined, implying a lower welfare cost of debt. This assertion is based on Barkai (2020) finding that consistent with the magnitude of the increase in economic profits, the value of intangible capital would need to be much larger than is currently measured by the BEA. However, our analysis shows a much milder increase in economic profits, which suggests that the decline in the average marginal product of capital may not be as significant as Blanchard suggests, implying potentially larger welfare costs of public debt. Edmond et al. (2018) find aggregate markups account for two-thirds of welfare costs in their benchmark model calibrated to aggregate markups from Barkai (2020). In a similar vein, Eggertsson et al. (2021) explain the recent US increase in Tobin's Q and divergence in marginal and average return on capital using a model calibrated to the current prevailing estimates of economic profits and markups in the US economy. Furthermore, Baqaee et al. (2021) show a procyclical response in TFP, calibrating their model with prevailing aggregate markup measures.

We carefully examine the long-term trend of declining capital costs and increasing profits. We demonstrate that the dramatic decline in the capital share of production and the increase in the profit share is significantly smaller than reported in the literature and extremely sensitive to the start date. A small extension of the sample period explains over 30% of the linear trend on the required return on capital, 23% of the trend in the capital share, and 20% of the trend in the profit share. In dollar terms, a more representative sample period suggests that the increase in economic profits over the last 30 years is smaller by almost \$300 billion or nearly \$3 thousand for each of the approximately 80 million employees of the non-financial corporate sector.

The trend of rising corporate profits has several implications for the economy. One of these is the rise of "super-star" firms (Autor et al., 2020; Hall, 2018). These highly successful companies dominate their respective markets and contribute to increased industrial concentration and potentially reduce competition (Grullon et al., 2019). The trend of rising corporate profits may also be associated with declining business dynamism (Covarrubias et al., 2020; Akcigit and Ates, 2021). Declining new firm entry and competitiveness can lead to decreasing competition and increasing markups. Since 1980, De Loecker et al. (2020) found that firm-level measured markups have increased from 21% to 41% above marginal cost. Rising profits may have negative consequences for consumers suggesting the need for more vigorous antitrust enforcement and increased corporate transparency to protect competition and political stability (Shapiro, 2019; Zingales, 2017).

Some have provided alternative explanations for the discrepancy between total income, labor income, and capital income. In a model with multiple sectors, Rognlie (2016) finds that the unexplained share of residual income and the higher role of net capital income is largely by the housing sector. Karabarbounis and Neiman (2019) find that economic profits are unlikely to explain the magnitude of the difference between US domestic GDP, payments to labor, and imputed rental rates of capital; They argue other sources likely contribute to rising residual income, including potential mismeasurement.

2 Methodology

The data on nominal gross value added and compensation of employees in this analysis are originally from the National Income and Productivity Accounts Table 1.14 and the capital data are originally from the BEA Fixed Asset Table 4.1. We access the data through the replication package for Barkai (2020) and run the author's replication code. We then compare the output of our results with those reported in the literature and conduct an accounting exercise to calculate the change in implied markups on gross value added and gross output. Lastly, we conclude our findings.

3 Results

Figure 1 displays the time series of the cost of capital over the last 30 years. The red line portion shows the data extended to the maximum sample available in the replication package. The right panel of figure 1 plots the linear time trend of the cost of capital varied by sample. Moving across the x-axis removes years cumulatively from the beginning of the sample. Red points indicate the inclusion of the last year in the sample. A quadratic function is then fitted over these points. The linear trend for the cost of capital is steepest when starting the series in 1984 and ending it in 2014. Data from the beginning of the sample is highly influential. Extending the data on the required rate of return in the sample decreases the start of the time series by 6 pp and increases the end of the time series by 2 pp.

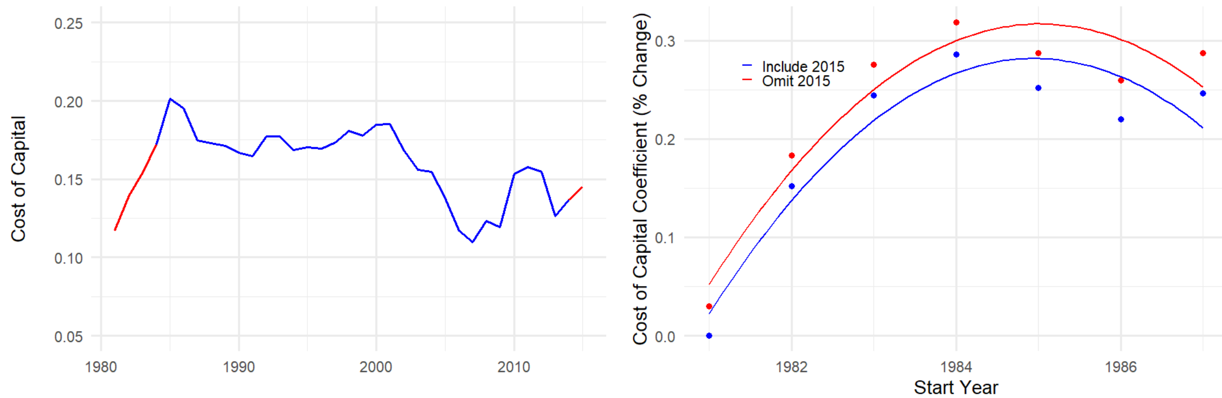

Figure 1: Implied Cost of Capital (Required Rate of Return)

Figure 2 displays the time series of the capital share of output over the last 30 years. The red line portion shows the data extended to the maximum sample available in the replication package. The right panel of figure 2 plots the linear time trend of the capital share varied by sample. Moving across the x-axis removes years cumulatively from the beginning of the sample. Red points indicate the inclusion of the last year in the sample. A quadratic function is then fitted over these points. The linear time trend for the capital share of output is steepest when starting the series in 1984 and ending it in 2014. The years from the beginning and end of the sample are highly influential. Extending the data on the capital share in the sample decreases the start of the time series of the rate by 9 pp and increases the end of the time series by 2 pp.

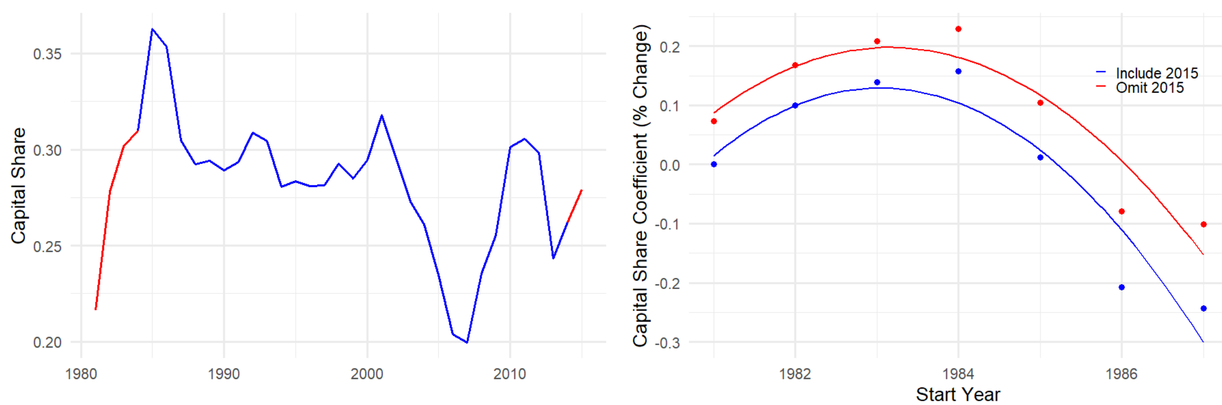

Figure 2: Capital Share of Output

Figure 3 displays the time series of economic profit over the last 30 years. The red line portion shows the data extended to the maximum sample available in the replication package. The right panel of figure 3 plots the linear time trend of economic profits varied by sample. Moving across the x-axis removes years cumulatively from the beginning of the sample. Red points indicate the inclusion of the last year in the sample. A quadratic function is then fitted over these points. The linear time trend for profit is steepest when starting the series in 1984 and ending it in 2014. The years from the beginning and end of the sample are highly influential. Extending the data on the capital share in the sample increases the start of the time series of the rate by 8 pp and decreases the end of the time series by 5 pp.

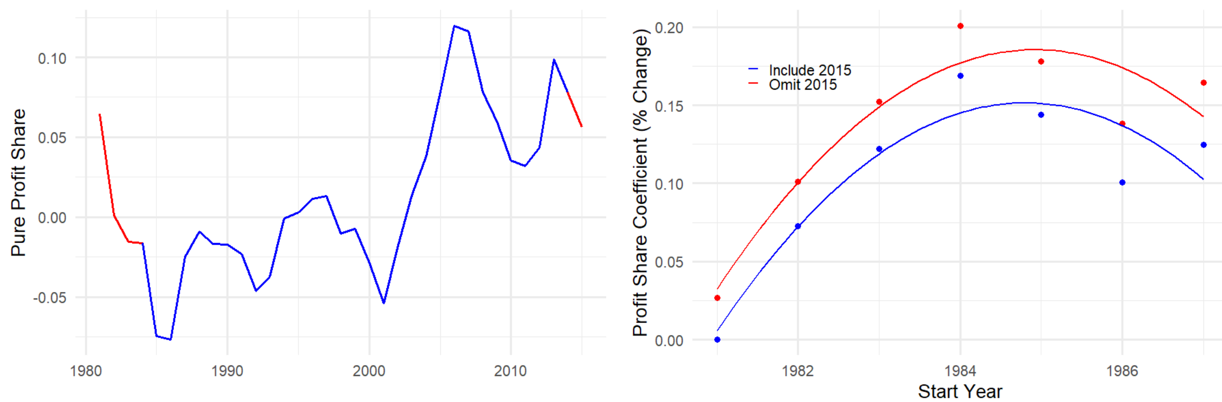

Figure 3: Economic Profit (Economic Profit Share of Output)

sample	return on capital	capital share	profit share
1981 – 2014	0.030	0.073	0.027
1982 – 2014	0.183	0.168	0.101
1983 – 2014	0.275	0.208	0.152
1984 – 2014	0.318	0.229	0.201
1985 – 2014	0.287	0.105	0.178
1986 – 2014	0.259	-0.080	0.138

Table 1: Time Series Effect

To determine the effect of varying our sample on linear time trend lines, we exclude data from the beginning or end of the sample period for the required rate of return, capital share, and profit share. Table 1 summarizes the results of time series behavior on the coefficients of the linear time trends for the required rate of return, capital share, and economic profit share from the second panel of figures 1, 2, and 3. The values listed in table 1 are the fractional changes in the slopes of the linear trends. The changes are calculated by subtracting the ratio of the slope of the largest available data within the replication package (1981 - 2015) from the slope of each reduced sample. We find that the trend is steepest when examining the period from 1984 to 2014. Shorter or longer variations yield weaker results.

We see that extending the data sample by a few years has a large effect on the long-term trend in profits. Profit rates also have an implication for markups as a measurement of pricing power. We next examine the impacts of our extrapolated profit rates on aggregate markups.

Following the example of Basu (2019), we extend our analysis with a back-of-the-envelope calculation to determine the change in firm markups and thus extract a measure of market power.[1]. The corporate profits literature using a national accounting approach finds the profit -5.6 percent in 1984 and 7.9 percent in 2014, an increase of 13.5 pp. The implied markup ratio μ rises from 0.95 to 1.09 over this period. The markup on gross output, μ^G, rises from 0.91 to 1.22. Using the full sample, we find the profit rate at -3.25 percent in 1984 and 6.5 percent in 2014, an increase of 9.5 pp. μ then rises less from 0.97 to 1.07. The markup on gross output, μ^G, rises less from 0.94 to 1.15. The implications for the revised estimates of markups are significant. The estimated markup for gross value added in 2014 is one-fourth smaller than currently implied and the estimated markup for gross output is one-third smaller than frequently referenced in the literature.

4 Conclusion

The exact quantification of capital share, costs of capital, and profit measures are sensitive to when you start measurement. Time series effects can explain up to one-third of the increase in profit over the last 30 years or up to $3 thousand per person. Likewise, the increase in markups on gross value added and gross output over the last 30 years is smaller than previously estimated. It is important to carefully consider the timing of data collection to help mitigate the impact of temporal sensitivity on the results.

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[1]The two markup concepts are related through $\mu = \frac{\mu^G(1-s^M)}{1-\mu^G s^M}$, where μ is the markup on value added, μ^g is the markup on gross output, and s^M is the intermediate input share of revenue. s^M is assumed to be 0.5, approximately the average value for the US economy in the long run.

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