The Beginning of the Trend: Interest Rates, Markups, and Inflation

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Abstract

Recent literature argues the decline in real interest rates led to significant increases in economic profits and markups. Consequently, some have linked rising market power to inflation. We scrutinize the effect of time series sensitivity on estimating secular trends through two relevant examples: increasing market power perceived as rising markups and the influence of corporate profits on inflation. Our analysis reveals that a four-year shift in sample start dates significantly affects economic profit growth trends, accounting for 19% of the trend, or $3,000 per worker in 2014. Likewise, our qualitative evidence suggests that increased corporate profits are unlikely to drive inflation.

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Keywords: Secular Trends, Interest Rates, Cost of Capital, Profits, Markups

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Since the early 1980s, the labor share of value-added and the real interest rate have significantly declined, contributing to a debate about the implied rise in market power. In a leading example, Barkai (2020) delineates these trends attributing the decline in interest rates to a decrease in the cost of capital, while capital growth remained constant, resulting in a 7 percentage point decrease in the capital share. This led to a 14 percentage point increase in the implied economic profit share, amounting to over $1 trillion of economic profits in 2014. Rising market power has also contributed to discussions relating to corporate profits and inflation. For example, Weber and Wasner (2023) argue that pandemic-era inflation was predominantly a result of sellers increasing prices due to their increased market power.

In our first example, we examine the sensitivity of economic profit and markup estimates to sample dates. Including just 4 additional years explains 33% of the trend in the real interest rate, 45% in the cost of capital, 19% in the profit share, and 19% in the aggregate markup. This sensitivity, amounting to over $250 billion or $3 thousand per worker in 2014, is rooted in the volatility of real interest rates and the cost of capital, particularly during the peak of interest rate volatility in the 1980s. In our second example, we examine the striking association between rising corporate profits and inflation. Shifting the starting window by a few years nullifies the relationship between profits and inflation. Our findings contribute to the ongoing debate about the relationship between real interest rates and profit shares and the role of market power in inflation, underscoring the need for careful sample selection in economic trend analysis. Our findings also have important implications for explaining disparate estimates, calibrating macroeconomic models, and understanding secular trends.

The literature presents a range of estimates for the growth of markups, with different methods and periods leading to disparate results (Basu, 2019; Syverson, 2019; Berry et al., 2019). Our findings highlight the importance of considering the volatility of the real interest rate and the sensitivity of the estimates to the sample start date. This has implications for macroeconomic modeling

and welfare estimation, where precise measurements of economic profits and markups are key targets (Edmond et al., 2018; Eggertsson et al., 2021). For instance, Blanchard (2019) cites profit estimates as evidence to argue the cost of public debt is small.

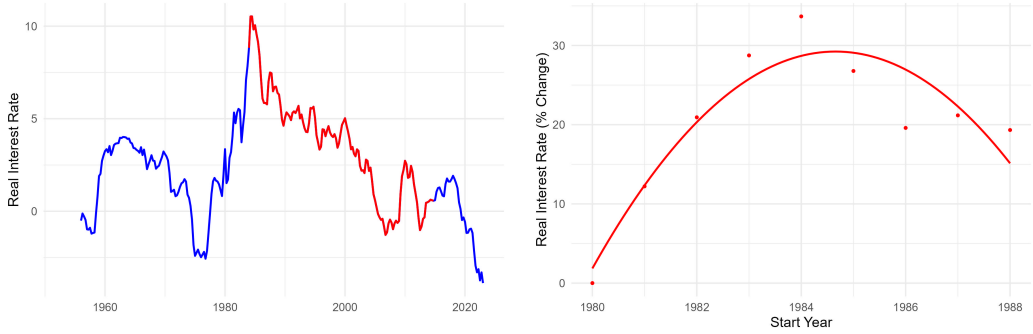
Lastly, our analysis contributes to ongoing research on secular trends in the US economy. Examples include the rise of nation-level concentration (Covarrubias et al., 2020), super-star firms (Autor et al., 2020), and measured public-firm markups (De Loecker et al., 2020; Traina, 2018). Many authors have proposed explanations for the discrepancy between labor income, measured capital income, and implied profit income (Rognlie, 2016; Karabarbounis and Neiman, 2019; Eggertsson et al., 2021; Davis et al., 2023). Rognlie (2018) suggests that a deviation of the rental rate of capital from the usual user cost formula based on bond returns is the most promising explanation for the observed trends. Our analysis supports this view, demonstrating that the estimated trends are highly sensitive to variations in the real interest rate, a key component of the user cost formula.

1 Interest Rates, Profits, and Markups

We employ the method of Hall and Jorgenson (1967) to measure the cost of capital using financial market rates, which track the decline in the market yield on 10-year US Treasuries (Barkai, 2020; Karabarbounis and Neiman, 2019; Davis et al., 2023). We then measure profits and markups as the residual from national income less payments to labor and capital. Tax rates come from the Organisation for Economic Cooperation and Development and the Tax Foundation. The rest of the underlying data are from the Bureau of Economic Analysis's National Income and Product Accounts Table 1.14 (gross value added, compensation of employees), Fixed Assets Accounts Table 4.1 (capital stock, depreciation, and inflation), and Integrated Macroeconomic Accounts Table S.5.a (inventories). Our exercise visualizes the trends in the national accounts and calculates the change in the estimated linear slope for different

start dates and finds long differences for varying end dates.

Figure 1a displays the real interest rate. The portion in red is from 1984 to 2014, the period commonly referenced in the literature. Figure 1b plots the percentage change in the linear trend of the real interest rate, starting from different years. We fit a quadratic function over these points.



(a) Real Interest Rate (b) Leverage of Start Year

Figure 1: Real Interest Rate: $i - \nu$

The linear trend for the real interest rate is steepest when starting the series in 1984. Data points from the beginning of the sample are influential. The real interest rate is 6.5 percentage points lower in 1980 than in 1984. The peak in the real interest rate occurs in 1984. The peak in interest rate volatility occurs in 1981 and 1984.

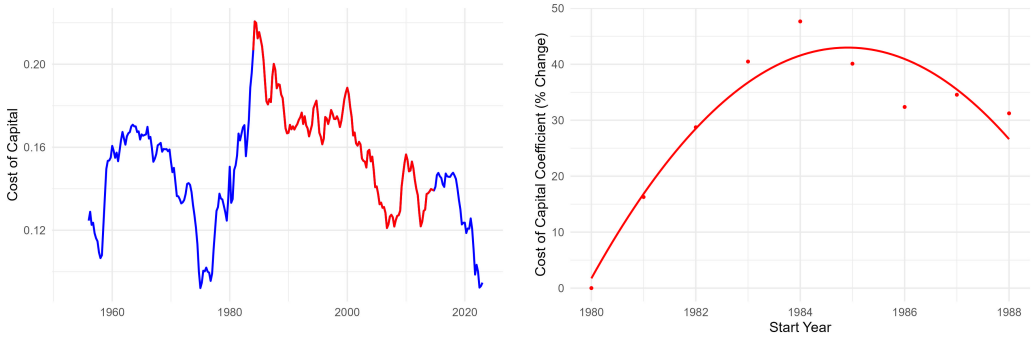
Following Hall and Jorgenson (1967), the cost of capital R_c is:

$$R_c = (\rho - \nu + \delta) \frac{1 - z\tau}{1 - \tau}.$$

Here, ρ is the weighted average financial cost of capital and is defined as $dR_d + (1-d)R_d$, where d is the debt share of assets, R_d is the return on debt, and R_e is the competitive return on equity. ν is expected capital inflation, z is the net present value of deprecation allowances for capital, τ is the corporate tax rate, and δ is the depreciation rate. Barkai (2020), Karabarbounis and Neiman (2019), and Davis et al. (2023) all show the weighted average financial cost of capital ρ closely tracks the interest rate i; we focus on ρ to make it

easy to compare with Barkai (2020).

Figure 2a displays the cost of capital. The portion in red is from 1984 to 2014, the period commonly referenced in the literature. Figure 2b plots the percentage change in the linear trend of the cost of capital, starting from different years. We fit a quadratic function over these points.



(a) Cost of Capital (b) Leverage of Start Year

Figure 2: Cost of Capital: R_c

The trend for the cost of capital is steepest when starting the series in 1984. Data points from the beginning of the sample are highly influential. The cost of capital is 6.2 percentage points lower in 1980 than in 1984. Comparing the endpoints of the sample, the cost of capital is nearly the same in 1980 and 2014.

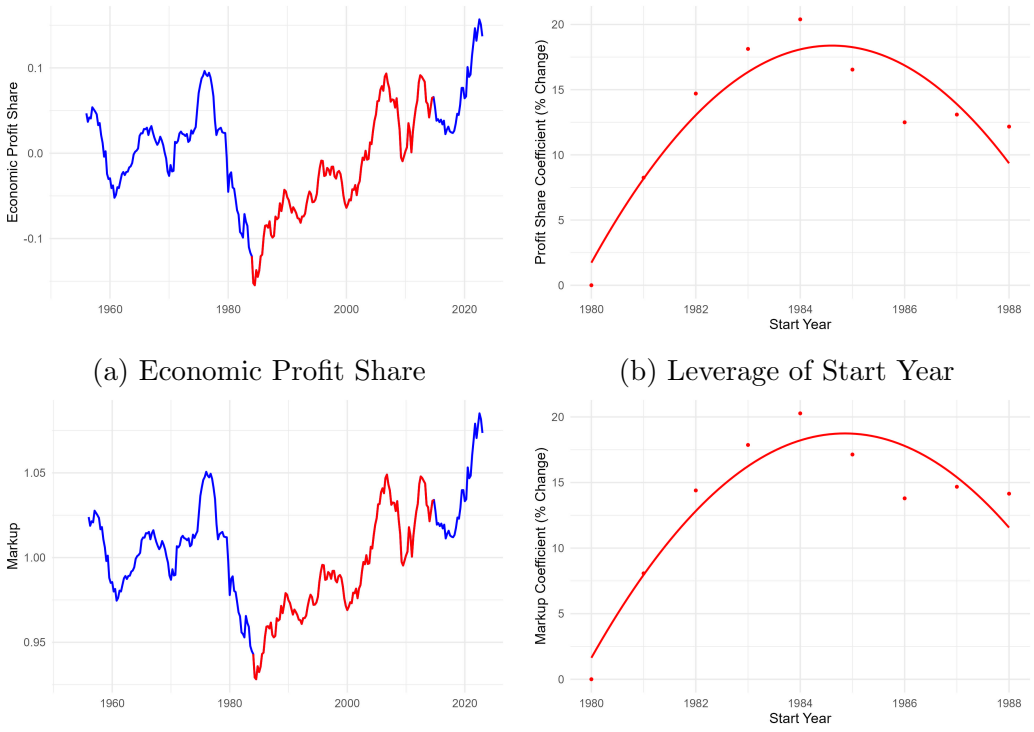
Following Barkai (2020), the economic profit share measures earnings in excess of production costs, including the cost of capital. It is fundamentally a residual after subtracting labor and capital payments from value-added:

$$\Pi = 1 - \frac{WL}{Y} - \frac{R_c K}{Y}.$$

Following Basu (2019), we can convert this measure of market power to an implied markup on gross output as in De Loecker et al. (2020). Assuming constant returns to scale and an intermediate input share of revenue of 0.5, we have:

$$\mathcal{M} = \frac{2}{2 - \Pi}.$$

Figures 3a and 3c display the economic profit share and implied markups on gross output. Figures 3b and 3d plot the percentage change in the linear trend of the real interest rate and implied markups, starting from different years. Again, we fit a quadratic function over these points.



(a) Economic Profit Share

(b) Leverage of Start Year

(c) Implied Markup on Gross Output

(d) Leverage of Start Year

Figure 3: Economic Profit: Π, Markups: $\mathcal{M}$

The trends for profits and markups are steepest when starting the series in 1984. The data from the beginning of the sample are influential. Economic profits are 8.6 percentage points higher in 1981 than in 1984.

2 Profits and Seller's Inflation

Measured increases in markups and profit have focused recent discussions on the relationship between market power inflation (Konczal and Lusiani, 2022; Glover et al., 2023). Weber and Wasner (2023) provide a compelling perspec-

tive on the relationship between corporate profits and inflation, suggesting that inflation during the pandemic was predominantly a result of sellers increasing prices due to their enhanced market power. This theory of seller's inflation or "Greedflation" has gained significant media attention and academic attention. The direct link between corporate profits and inflation underscores a large potential welfare loss with monopoly, anti-trust, and monetary policy implications.

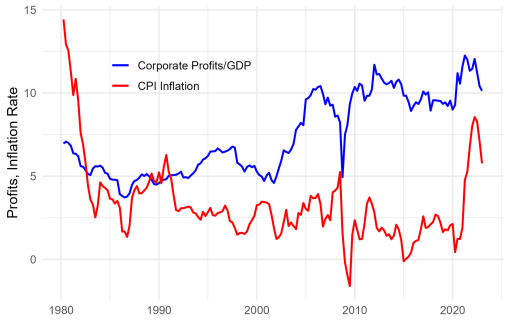
Seller's inflation is the increase in markups and corporate profits along with prices, effectively causing inflation through higher markups. In the data, this will show as a co-movement in CPI inflation and corporate profits. Figure 4a displays corporate profits as a share of GDP and CPI inflation from 1980. Figure 4b shows the correlation between these two variables, with a contracting window on the x-axis. To account for the effect of pandemic-era inflation, we vary the sample by ending it in 2023 and 2018.

Figure 4b reveals that "Greedflation" is largely a recent phenomenon. The correlation between profits and inflation becomes negative when considering data before 2000 and is highly unstable post-2000 when excluding the pandemic. This variability presents a significant challenge to the "Greedflation" theory. For it to hold, it needs to explain why the correlation between profits and inflation breaks down across different periods.

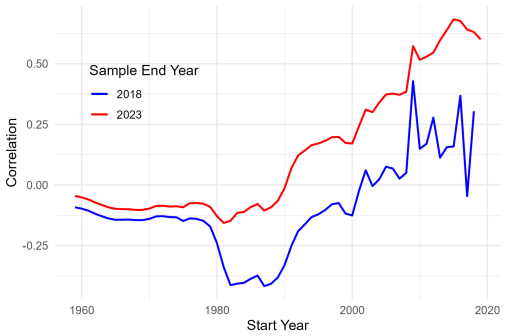
To further illustrate this point, Figure 4c displays the 10-year moving correlation between corporate profits as a share of GDP and CPI inflation. This figure shows that periods of elevated inflation and high "Greedflation" (correlations of profits and inflation) only appear since 2010. Earlier horizons provide little evidence to support the theory. For example, rising markups in the 1970s fail to move positively with inflation as in the pandemic.

3 Time Series Volatility

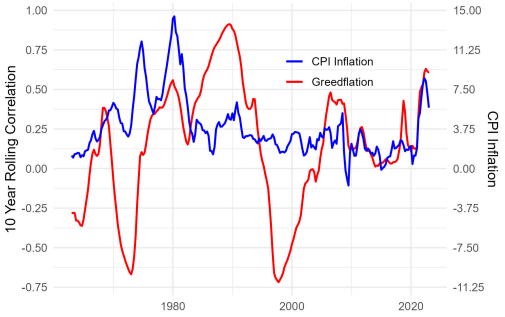
The concepts of "Greedflation" among other recent macro phenomena are particularly relevant to our discussion, as they are extrapolations from the



(a) Profits and Inflation



(b) Restricting Sample



(c) Rolling Correlation

Figure 4: Seller's Inflation

secular trends of rising markups and profits. These trends are mechanically the result of time variation in the realized interest rate, which is in turn due to variation in expected capital inflation. The financial measures that are used to determine these secular trends are notoriously volatile, and their fluctuations can significantly impact our understanding of economic realizations.

Figure 5 plots the volatility of the real interest rate, measured as the standard deviation of a 5-year rolling window. The secular trends in profits and markups (Figure 3) and the cost of capital (Figure 2) are most exaggerated when plotting across endpoints with the highest real interest rate volatility. Moving across these high-volatility years dramatically changes the trend slope. Coinciding with a spike in volatility after 2019, economic profits are at record levels of 14 percent in 2021 and 2022.

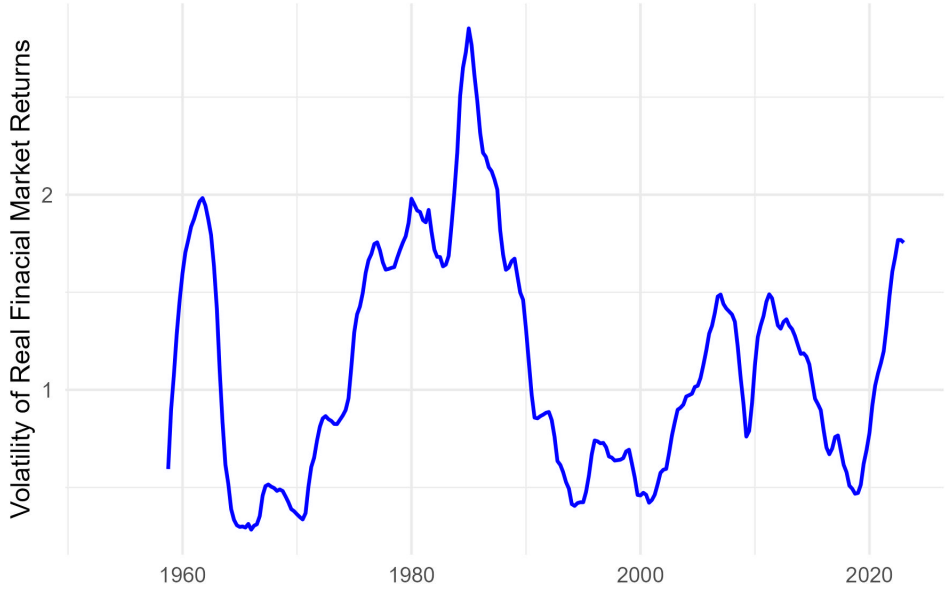


Figure 5: Volatility of Interest Rate

To illustrate the effect of time-series volatility on sample point-to-point estimates Table 1 collects the 15-year-long differences of our main variables by sample stop year. As volatility declines in the sample the long difference in interest rates, the cost of capital, profits, and markups nearly vanish. However,

after 2019, a spike in the volatility of real interest rates increase the difference by a factor of 3.

Sample	$\Delta(i-\nu)$	ΔR_c	$\Delta\Pi$	$\Delta\mathcal{M}$
2012	-3.65	-3.62	7.58	0.39
2014	-3.95	-4.28	10.35	0.52
2016	-2.54	-2.45	8.40	0.042
2018	-0.41	-0.61	2.90	0.014
2020	-1.78	-1.64	2.06	0.011
2022	-2.32	-2.33	6.64	0.037

Table 1: 15 Year Long Differences by Sample Start End Date

We find that the most pronounced trends in interest rates, profits, and markups emerge in 1984, a year characterized by peak real interest rates. These rates are calculated as the nominal interest rate less expected capital inflation. Notably, this peak occurred years after the zenith of nominal interest rates in 1981, a phenomenon we attribute to the high volatility of capital inflation during this period.

The prevailing methodology for calculating economic profits and implied markups takes into account payments to labor and capital. It's crucial to understand that the return on capital and labor are not as susceptible to fluctuations as financial market rates. Indeed, many firms, particularly those without easy access to extensive financial markets, secure financing at rates that are less volatile with lower returns. The return on capital is much more stable and has a lower average compared to the return on the S&P 500. To account for the volatility of the return on capital and the return on the S&P 500, canonical models break the equivalence between the return on capital and the return on equity (Gomme et al., 2011). The volatility in the return on capital can introduce significant variation in the calculated markups and profits, which ultimately affects the observed trends. Therefore, the significant trends in profits and markups observed around 1984 and 2023 are likely influenced by the volatility in the cost of capital, which can be attributed to factors such as

changes in expected capital inflation.

The trends observed in economic profits, markups, and capital costs among others may not necessarily represent real secular changes. Instead, they could be the result of measurement error attributed to the volatility in the underlying time series of the macro variables. Measuring from points of lower volatility, anywhere from a fourth to half of the trend of the variables in our exercise can be explained. We have highlighted the significant role of sample selection in the estimation of economic trends. Our analysis, reveals that extending the sample backward by merely 4 years accounts for 19% of the increase in economic profits over the last 30 years, translating to $3 thousand per worker in 2014. Likewise, we showed that "Greedflation", while plausible since 2010, is unlikely to reconcile the realization of inflation on a longer horizon. Any secular trend can suffer from measurement error, especially from points of high volatility. In light of our findings, we argue that future work on these topics should pay careful attention to the role of time series volatility. In particular, sensitivity analysis should be a standard part of the methodology when estimating trends in economic profits and markups to ensure estimates are robust to variation in the underlying data and establish a reliable basis for policy decisions.

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