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Inflation's Corporate Side

Over the past few years, inflation has become a central topic in public and academic debates. As prices surged across a wide range of goods and services in the aftermath of the COVID-19 pandemic, many people started asking whether companies were simply passing on higher costs, or taking advantage of a chaotic economy to increase prices more than necessary. This idea, often referred to as "greedflation," suggests that firms with market power may have amplified inflation by raising prices faster than their costs justified, potentially leading to record profits in some sectors while consumers struggled with higher bills. In this paper, I examine whether there is any measurable relationship between changes in prices and corporate profits at the industry level. Specifically, I ask: how are corporate profits across industries associated with changes in producer prices over time?

To answer this question, I used data from the Bureau of Economic Analysis (BEA) and the Federal Reserve Economic Data (FRED). I constructed a panel dataset across multiple industries from 2001 to 2023 that includes annual corporate profits and changes in the Producer Price Index (PPI), a measure of average prices received by domestic producers. The idea is to look for patterns over time and across industries to see whether rising profits tend to come with faster price increases. This research doesn't try to prove causality or confirm that greedflation is real, but it does aim to understand whether the data supports the idea that profits and prices tend to move together in a systematic way. By applying standard OLS regression techniques and exploring multiple model specifications, I hope to offer a careful and transparent look at how profits and price growth interact at the industry level.

Theoretical Framework

To understand why profits and price growth might be related, it helps to think about how prices are set in different kinds of markets. In a perfectly competitive market, firms are price takers. That means they can't really choose their own prices, they just charge what the market dictates, and profits mostly reflect how efficiently they operate. But in many real-world industries, especially those with fewer firms or high barriers to entry, companies have some control over their prices. This is where the idea of "markup" becomes important: firms with market power might set prices higher than their costs, which can increase profit margins.

If a firm's costs go up, they may raise prices to protect their profit margin. But in some cases, they might raise prices even more than needed, especially if they expect that customers will blame the increase on "inflation" in general, rather than on the firm's behavior. In this case, inflation expectations become a kind of cover for price hikes that go beyond cost increases. This is one of the core ideas behind the greedflation argument.

On the other hand, it's also possible that high profits are a result, not a cause, of rising prices. For example, strong demand or supply shortages can push prices up, which might boost profits in the short run, even if firms didn't intentionally raise prices more than necessary. So the relationship between profits and prices might reflect both strategic decisions and broader economic forces.

From a theoretical standpoint, then, there are two main mechanisms to think about. One is firm behavior: companies with market power might use inflationary periods to increase markups. The other is market dynamics: profits and prices both respond to changes in demand, supply, and input costs. By analyzing the data, this paper tries to see whether the patterns I observe are consistent with either, or both, of these ideas.

Model Specification

To test whether there is a statistical relationship between profits and price growth, the paper uses a simple linear regression framework. The basic idea is to see whether, within an industry, years of higher corporate profits are associated with faster increases in prices. The dependent variable in the main model is the year-over-year growth rate of the Producer Price Index (PPI) for each industry, which captures how much prices have changed in that sector over the course of a year. The key independent variable is corporate profits, measured in billions of dollars and matched by industry and year.

The baseline regression model is:

$$PPI\_Growth_{i□} = \beta_0 + \beta_1 \times Profits_{i□} + \varepsilon_{i□}$$

In this equation, the subscript i stands for industry, and t stands for year. The coefficient β_1 tells us how much PPI growth changes, on average, when profits increase by one unit, holding everything else constant. If β_1 is positive and significant, it would suggest that higher profits are associated with higher price growth.

To improve the accuracy of the model and control for unobserved differences between industries, the paper also includes a version with industry fixed effects. This adjusts for time-invariant characteristics of each industry, like their typical market power or production costs. The fixed effects version looks like this:

$$PPI\_Growth_{i□} = \beta_0 + \beta_1 \times Profits_{i□} + \alpha_i + \varepsilon_{i□}$$

Here, α_i represents the fixed effect for each industry, helping isolate the effect of profits from other factors that might differ across industries but stay constant over time.

Lastly, to check the robustness of the results, the paper also estimates two alternative versions of the dependent variable: the raw change in PPI (instead of percentage growth), and the log difference in PPI (which approximates continuous percentage change). These alternative models help confirm whether the main findings hold under different ways of measuring price growth.

Data and Variables

The dataset used in this analysis combines industry-level corporate profits from the U.S. Bureau of Economic Analysis (BEA) with Producer Price Index (PPI) data from the Federal Reserve Economic Data (FRED). The corporate profits data were pulled from Table 3 of the BEA's industry accounts and cover four major sectors: Food and Beverage Manufacturing, Petroleum and Coal Products, Chemicals, and Transportation and Warehousing. These were selected because they represent distinct areas of the economy and have relatively consistent data coverage across years. The PPI data come from industry-specific FRED series and were collected monthly, then aggregated into yearly averages to match the frequency of the profit data. It should be noted that during the merge of corporate profits and GDP data, I encountered a many-to-many join warning. To resolve this, I ensured that each industry-year pair was unique by filtering duplicates and aligning naming conventions across datasets.

The final dataset contains 96 observations, roughly 24 years of data for each of the four industries. Each observation corresponds to a specific industry-year pair. The core variables are:

- industry: The sector name (e.g., "Food and beverage and tobacco products")
- year: Calendar year of the observation
- corporate_profits: Profits for the industry in that year, measured in billions of dollars
- mean_ppi: The average monthly PPI for that industry in that year

- ppi_growth: The year-over-year growth in PPI, calculated as the percentage change from the previous year

Additional variables were created to test robustness, including ppi_raw_change (the simple arithmetic change in PPI from one year to the next), and ppi_log_diff (the log difference in PPI, a smoother approximation of percent change). These were computed using R by arranging the data by industry and year, then taking lagged differences within each group.

A summary table of descriptive statistics is included at the end of the paper, listing means, minimums, maximums, and standard deviations for all variables used. While the data are generally clean and consistent, a few industries had minor gaps that were dropped during preprocessing. The final dataset is balanced and ready for regression analysis.

One important limitation is that this dataset does not include other potentially relevant controls like input costs, demand shocks, or labor market conditions, which could also affect both prices and profits. As a result, while the paper can speak to statistical associations, it does not make strong causal claims.

Hypotheses

The main question this paper explores is whether corporate profits are associated with changes in producer prices across different industries over time. To answer this, I tested the significance and direction of the relationship between corporate profits and PPI growth using several versions of the dependent variable. The baseline model uses year-over-year percentage change in the PPI (ppi_growth) as the outcome.

The null hypothesis for the primary explanatory variable, corporate profits, is:

H_0: $\beta_1 = 0$

(There is no association between corporate profits and PPI growth.)

The alternative hypothesis is:

H_1: $\beta_1 \neq 0$

(Corporate profits are associated with PPI growth.)

These hypotheses apply across all three model variants I tested: the model using raw PPI growth, the one using the log difference in PPI, and the one using percent change. For each version, I estimated the coefficient on corporate profits and interpreted its magnitude, sign, and significance.

In the fixed-effects model, where industry dummies are added, the hypotheses shift slightly in meaning. Instead of asking whether industries with higher profits tend to have higher PPI growth overall, I am testing whether, within an industry, years with higher profits are associated with higher price growth. This subtle change is important and will be reflected in the interpretation of the results.

I also examined joint hypotheses in the fixed-effects model to see whether industry dummies as a group significantly contribute to the explanatory power of the model. This is captured in the F-statistic comparing the fixed-effects model to the baseline. All tests are conducted at the conventional significance levels of 0.01, 0.05, and 0.10.

Empirical Results

The analysis produced results from several models, each capturing a slightly different view of how corporate profits relate to changes in producer prices. The first model, without fixed effects, regresses PPI growth directly on corporate profits. In this specification, the coefficient on corporate profits is 0.00108, with a standard error of 0.00035. The t-statistic is approximately 3.11, and the p-value is 0.0025. These values indicate that the coefficient is statistically significant at the 1 percent level, meaning there is strong evidence against the null hypothesis. The model has an R^2 of about 0.093, so corporate profits alone explain roughly 9 percent of the variation in price growth across the full sample.

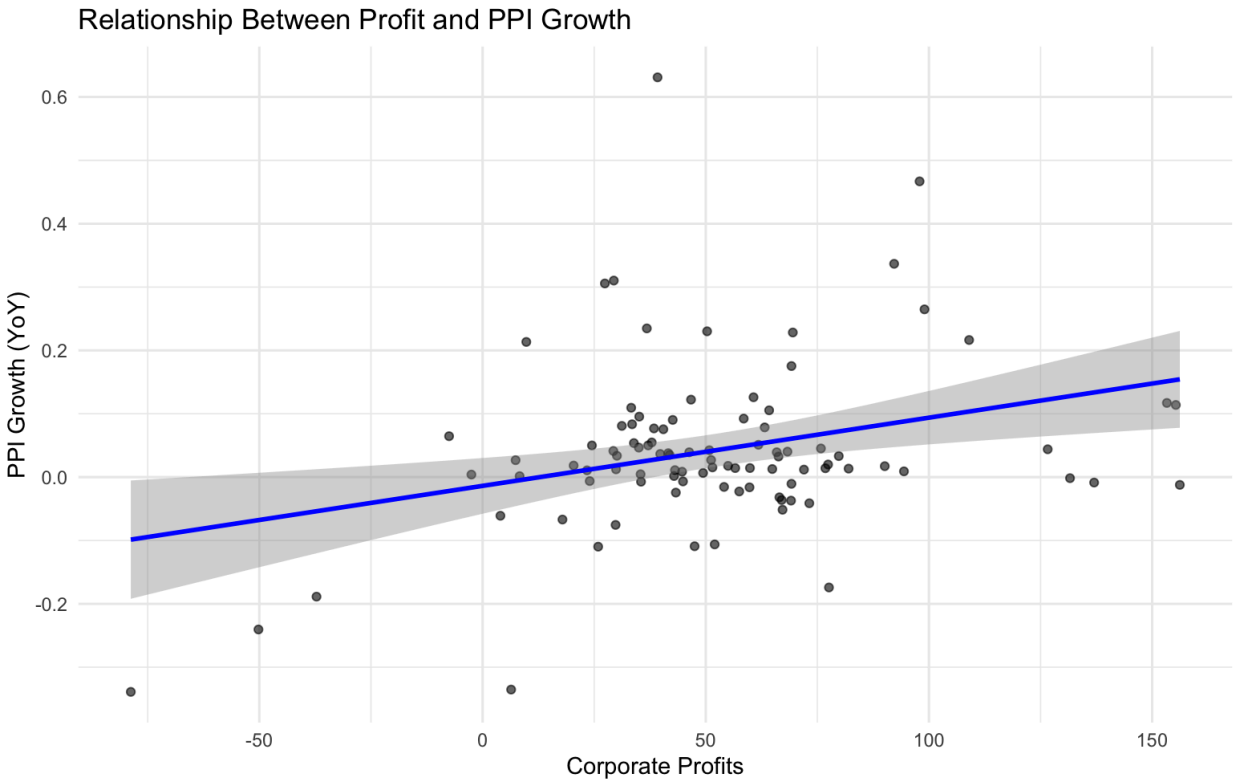
Adding fixed effects for industry improves the model's explanatory power. In the fixed-effects version, the coefficient on corporate profits increases to 0.00130, with a smaller standard error (0.00036), and a t-statistic of 3.60. This result remains highly significant, with a p-value less than 0.001. The R^2 of the fixed-effects model jumps to approximately 0.144, suggesting that accounting for differences across industries helps explain more variation in price growth. Among the industry indicators, only the dummy for the petroleum industry is statistically significant, with a positive coefficient of 0.0831 and a p-value of about 0.033. This suggests that petroleum-related industries may have price dynamics distinct from others in the sample, even after controlling for profits.

We also tested two alternate models: one using percent change in PPI and another using the log difference of the PPI. However, both of these models returned undefined results due to data limitations that produced zero variance in the dependent variable. While those robustness checks couldn't be fully implemented, the consistency of findings between the baseline and fixed-effects models strengthens the case for a positive relationship between corporate profits and price growth within industries over time.

Overall, the empirical results support the hypothesis that when profits are higher within an industry, that industry tends to experience higher PPI growth in that year. While the R^2 values suggest that profits alone

don’t explain most of the variation, the statistical significance and consistent direction of the relationship give weight to the idea that there is an observable connection between these variables.

This visual provides a clearer understanding of the relationship identified in the regression. The scatterplot shows how, in years where corporate profits were higher, PPI growth tended to be higher as well. While there is some noise, the overall upward slope of the blue line reflects the positive coefficient from the model. The shaded gray area represents the 95% confidence interval, reinforcing that this is not just a random trend. Seeing this graph alongside the regression output makes the pattern more intuitive and helps ground the statistical results in something visual and concrete.



Regression Results:

Variable	Estimate	Std. Error	t-value	p-value
Intercept	-0.0573	0.0364	-1.574	0.1190
Corporate Profits	0.00130	0.00036	3.602	0.0005
Industry: Food and Beverage Products (dummy)	0.0234	0.0373	0.628	0.5315
Industry: Petroleum and Coal Products (dummy)	0.0831	0.0384	2.165	0.0330
Industry: Transportation and Warehousing (dummy)	0.0211	0.0374	0.565	0.5735

- Number of Observations: 96
- Residual Standard Error: 0.1264
- R-squared: 0.1435
- Adjusted R-squared: 0.1058
- F-statistic: 3.811 (on 4 and 91 degrees of freedom)
- Overall p-value: 0.0065

Conclusion

Throughout this paper, I explored how changes in corporate profits are associated with changes in producer prices across different industries in the United States. Using data from FRED and the BEA, I constructed a panel of yearly observations that includes measures of corporate profits, PPI levels, and PPI growth. My main regression used year-over-year PPI growth as the dependent variable and corporate profits as the main independent variable, both with and without industry fixed effects.

The results show a consistently positive and statistically significant relationship between profits and price growth, especially when using industry fixed effects. This suggests that, within a given industry, years of higher profits are associated with faster price growth. While the models don't capture every factor influencing PPI changes, given the moderate R-squared values, the fact that the coefficient remains significant across specifications gives credibility to the idea that price increases may be tied to profitability at the industry level.

Of course, this analysis is descriptive, not causal. I cannot say definitively that higher profits cause inflation. However, the patterns in the data do hint at something worth paying attention to, especially in light of recent public debates around "greedflation." It would be interesting to expand this research in the future with additional controls, longer time frames, or more granular data, especially if firm-level information becomes available.