Stagflationary Stock Returns and the Role of Market Power *

Ben Knox [†] Yannick Timmer [‡]

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Abstract

We study the inflation implications for firms across the market power distribution from an asset pricing perspective. Inflationary surprises are associated with persistent declines in stock returns. Decomposing the present value identity of stock prices, we show that investors expect nominal cashflows to remain stagnant during periods of higher-than-expected inflation, a stagflationary view of the world, on average. However, we find that firms with a large degree of market power are shielded from the negative returns following inflation surprises, as market power firms are expected to generate a relative increase in their nominal cashflows in response to inflation shocks.

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†Federal Reserve Board. Email: ben.knox@frb.gov

‡Federal Reserve Board. Email: yannick.timmer@frb.gov

The high inflation in 2022 triggered a debate on the role of firm market power in rising prices, potentially suggesting that firms with market power benefit from inflation.[1] However, as documented in an extensive literature starting with Fama and Schwert (1977), periods of high inflation have historically been associated with lower stock prices, and, more recently, the strong decline in stock prices starting in the beginning of 2022 has often been attributed to high inflation.[2] This empirical evidence and market commentary seemingly contradict the thesis that inflation benefits firms. To explore further, in this paper we study the role of inflation for stock returns, disentangling the cashflow and discount rate channels of stock returns in response to inflation news, and consider the implications across the market power distribution of firms.

Using a high-frequency identification approach around inflationary news, defined as the difference between the CPI data release and consensus expectation, we provide evidence that stock market investors have a stagflationary view of the world; in response to inflation news, investors expect nominal cash flows to remain stagnant while nominal discount rates increase. However, firms with market power are shielded from stagflationary stock returns, as they are expected to keep real cashflows constant.

We first document that the overall stock market is adversely affected by inflationary news, and that negative returns following inflation shocks persist for multiple days. Under the present value formula of the equity price, unexpected stock returns must be due to changes in investors' expectations of future dividends (cashflow news) or future returns (discount rate news). Nominal interest rates increase with expected inflation (Fisher, 1930), but if stocks cashflows are real assets, as conventional wisdom suggests, then nominal expected cashflows should increase with inflation. The negative stock returns in response to inflation news must therefore come from a combination of declining expectations of future real cashflows and increases in real discount rates, where the latter can occur via increases in investor expectations of future real risk-free rates, or because of an increase in the equity risk premium.

We use observable data to decompose the negative stock returns in response to inflationary news into discount rate and cashflows news in the spirit of Knox and Vissing-Jorgensen (2022). Starting with the risk-free rate component of discount rates, we find, unsurprisingly, that nominal interest rates are increasing in response to inflationary news. However, when further decomposing nominal interest rates into real interest rates and inflation expectations, we attribute the entire rise in yields

[1]For instance, Joe Biden tweeted on May 13, 2022 "You want to bring down inflation? Let's make sure the wealthiest corporations pay their fair share." Elizabeth Warren tweeted on May 25, 2022 "Concentration results in market power & corporations use it to jack up prices & profiteer during inflationary times."

[2]For instance, the Financial Times wrote "US stocks record worst weekly loss in 2 months on inflation fears" on Feb 24, 2023.

to inflation expectation rather than to an increase in real interest rates. By studying movements in the real yield curve in response to inflationary news, our method allows us to estimate investor expectations of the Taylor Rule in real time. Counter to the Taylor-rule hypothesis that interest rates rise more than inflation expectations, leading to higher real rates, we find the opposite, with real yields at the policy sensitive 2-year maturity declining in response to inflation news. Moreover, while on monetary policy decision days inflation expectations seem anchored with changes in long-dated nominal forward rates driven by real yields (Hanson and Stein, 2015), we find changes in long-dated nominal forward rates around CPI releases are associated with large changes in long-dated forward inflation expectations, suggesting that inflation expectation may not be fully anchored and are driven by extrapolative expectations instead (Gürkaynak et al., 2005).

As we find no evidence of an increase in real rates around inflationary news, the negative stock returns must be driven by a combination of declines in real expected cashflows and increasing equity risk premium. Indeed, using a two-stage regression estimation, we find an a role for both return components. In the first stage, we regress stock returns on a vector of changes in observable discount rates that include the real yield curve (across various maturities) and the Martin (2017) equity risk premium.[3] From this first stage, we extract the predicted component of stock returns that are due to (i) changes in real yields, (ii) those that are due to changes in the equity risk premium, and (iii) a residual that we interpret as changes in investor expectations of cashflows. In the second stage, we regress these separate return components on inflation news. Following a one percentage point inflation shock, we observe a 2.3 percent 1-day negative real return on the stock market, of which we attribute 30 percent to increasing equity risk premium, 63 percent to declining real cashflow expectations, and a small 6 percent to real yields (that are broadly unchanged).

We next turn to evidence from dividend futures to provide further support to the stagnant cashflow channel. Although on a smaller sample period due to data availability (2016-2022), these instruments provide a more direct measure of investor's expectations of cashflows on the aggregate stock market (Gormsen and Koijen, 2020). We adjust dividend futures prices for risk premium, following Knox and Vissing-Jorgensen (2022), and then regress these risk premium adjusted dividend futures prices on inflation news. The key takeaway is the same as in the two-stage regression estimation approach: nominal cashflow expectations are unchanged following inflation news, while real dividend expectations decline significantly.

[3] While this is theoretically a lower bound, Martin (2017) provides empirical evidence that it is approximately tight.

If the marginal investor indeed has a stagflationary view of the world, expecting nominal growth and dividends to remain stagnant or fall, while inflation increases interest rates, they are unlikely to do so homogeneously across firms. Firms operating in a competitive environment are less able to set prices over marginal costs, as their demand curves are highly elastic, preventing them from generating additional cash flows with inflation. In contrast, firms that exhibit product market power can raise prices above marginal costs without suffering an entire loss in demand. Firms with market power can, therefore, re-optimize their pricing strategy with inflation, potentially shielding themselves from a reduction in real cash flows. This pricing power partially protects firms with market power from stagflationary stock returns. We find evidence consistent with this hypothesis.

Our measure of market power is based on estimating their markup using a production approach following De Loecker and Warzynski (2012) and De Loecker et al. (2020). Market power is defined as firms' ability to set its price above marginal costs and hence do not face a perfectly elastic demand curve (Syverson, 2019). We estimate these firm-level markups using Compustat data with a production function approach under which the markup of a firm can be defined as sales over cost of goods sold multiplied by the output elasticity of inputs. Intuitively, sales over cost of goods would be equal to the ratio of price to average variable cost if both are divided by output, but as average variable costs do not necessarily equal marginal costs, the ratio needs to be multiplied by the output elasticity of inputs which is obtained from a production function estimation.

Equipped with our measure of market power, we study the asset pricing implications in response to inflationary news across the firm distribution. We start by splitting firms into high vs. low market power firms, based on whether they have above the 75th percentile or below the 25th percentile of markups in the previous year in the cross-section of firms, and inspect their stock price response to inflationary news. Firms with low markups see a decline in their stock price of around 3.9% in response to one percentage point inflationary news, while firms at the upper quarter of the markup distribution see a statistically insignificant decline of 1.2% decline of their stock price in response to a one percentage point inflationary news.

Motivated by this evidence, we turn to estimating the differential response of firms with a larger degree of market power. We use an empirical specification that allows us to control for observed and unobserved time-variant factors across firms, including firm balance sheet characteristics, exposure to asset pricing factors, and time-variant industry effects. We first show firms with a differential degree of market power exhibit statistically indistinguishable stock returns and hence no differential pre-trend in returns before the announcement of inflation. Once higher-than-expected inflation is released, firms with a larger degree of market power statistically and economically outperform those with limited abilities to set prices over marginal costs. Economically, a one standard deviation larger degree of market power increases the stock return by 0.2 percentage points in response to a one percentage point inflationary shock.

The relatively better performance of firms with market power can again be attributed to their differential sensitivities with respect to changes in interest rates or the risk premium. For instance, if interest rates rise in response to higher inflation and firms with market power are less sensitive to increases in interest rates, e.g. because their cash flows are nearer in the future than those with less market power and hence discounted less strongly, their stock response may be weaker. Moreover, firms across the market power (Liu et al., 2022; Kroen et al., 2021; Duval et al., 2023, 2021), leverage (Ottonello and Winberry, 2020), or tangibility (Döttling and Ratnovski, 2023) distribution may exhibit differential sensitivities of cashflows themselves to the interest rate environment other than through through a cashflow discounting channel. The differential response of firm returns to inflation shocks may therefore be mediated through an increase in nominal interest rates, potentially due to changes in nominal monetary policy expectations, rather than real cash flow expectations directly related to the effect of inflation and market power.

To test which component of stock returns is responsible for the differential response of stock returns around inflationary news, we extract the cash flow component of variation in the cross-section of stock returns, following a similar two-stage strategy as for aggregate stock returns. This time, we interact firm characteristics, such as markups, leverage, and tangibility, with changes in observable discount rate and extract a residual of firm-stock returns that we again interpret as a real cashflow component of stock returns. This approach allows us not only to control for differential sensitivities of firm stock returns to interest rates due to cashflow discounting, but also for many other economic mechanisms through which changes in discount rates impact firms' cashflows. Hence, we can isolate the direct effect of inflation news on expected cashflows across the markup distribution. Consistent with a stagflationary view of the world, we find that real cashflow expectations are declining substantially after inflationary news for firms without a substantial degree of market power. In sharp contrast, when focusing only on firms at the top quartile of the market power distribution, we do not find that investors expect declining real cashflows for those firms.

Our results can potentially have important macroeconomic implications. The findings suggest that inflation leads to a reallocation of activity from competitive firms to those that have higher markups, leading to more market power in general equilibrium. As these firms charge higher prices than their competitors and their share in the economy rises, the initial inflation surprise can be self-reinforcing, leading to higher prices due to a larger share of firms with high markups. The results therefore also have important implications for monetary policy. Tightening monetary policy to reduce inflation is not only associated with higher stock prices but comes with a reallocation from high to low market power firms, leading to a more competitive economy with a lower price level.

The rest of the paper is organized as follows. In section 1 we discuss the strains of literature that we contribute in this paper. In section 2 we present the data. In section 3 we lay out the empirical strategy. In section 4 we present the results. In section 5 we conclude.

1 Literature

Our paper connects two main strands of the literature; the effects of inflation on asset prices, and the financial consequences of firms' market power.

Inflation and Asset Prices. A long literature studies that the negative correlation between inflation and equity prices (Lintner, 1975; Fama and Schwert, 1977; Firth, 1979; Pearce and Roley, 1988; Boudoukh et al., 1994; Sharpe, 2002; Bekaert and Engstrom, 2010). To explain the negative correlation, Modigliani and Cohn (1979) and Summers (1980) argue that investors may suffer from money illusion as real cash flows are incorrectly discounted with nominal discount rates, with Cohen et al. (2005) and Campbell and Vuolteenaho (2004) providing empirical evidence supporting this argument. Katz et al. (2017), in contrast, find evidence consistent with sticky discount rates, with investors slowly adjusting nominal discount rates in response to inflation shocks. A separate hypothesis, first developed by Fama (1981) and Geske and Roll (1983), argues that the correlation between stock returns and expected inflation is due to stock returns anticipating future economic activity, with inflation acting as a proxy for expected real activity and, in particular, that a rise in inflation is associated with a decline in real activity. Piazzesi and Schneider (2006) argue that this negative correlation between economic growth and inflation leads to an inflation risk premium on nominal bonds, compensating investors for the risk of higher inflation and thus delivering an upward-sloping nominal yield curve. A more recent literature has since observed that the correlation between inflation and real activity is time-varying, with several papers exploring the connection between a shift in the stock-bond correlation since the 1990s and a shift in the correlation between inflation and real activity to be more positive (Campbell et al., 2017; Boons et al., 2020; Campbell et al., 2020; Cieslak and Pflueger, 2023;

Pflueger, 2023). Fang et al. (2022) show cross asset-class evidence that only core inflation, which strips out the contribution of energy to headline inflation, carries a negative risk premium. Bhamra et al. (2023) show that the negative impact of higher expected inflation on equity values is stronger for low leverage firms while, in a contemporaneous paper, Rubio Cruz et al. (2023) study the role of inflation in the cross-section of equity returns more broadly. Relative to the above literature on stock returns and inflation, we focus on the interaction between market power, inflation, and stock returns, and study the role of discount rates vs. cashflows in these interactions. Our identification is based on stock returns around inflation data releases, which relates our paper to a broader literature studying asset price responses to macroeconomic announcements more broadly (Beechey and Wright, 2009; Gürkaynak et al., 2010a; Bauer, 2015; Gilbert et al., 2017; Law et al., 2018; Gurkaynak et al., 2020; Boehm and Kroner, 2023; Kroner, 2023).

Market Power. The macroeconomic implications of market power have recently attracted a lot of interest (De Loecker et al., 2020, 2021; Peters, 2020; De Loecker and Eeckhout, 2018; Diez et al., 2018), as recent advances in the estimation of market power through markups (De Loecker et al., 2020; Syverson, 2019), as discussed in section 2, led to many empirical applications. For instance, Burya et al. (2022); Kroen et al. (2021); Duval et al. (2021) study empirically how market power interacts with monetary policy. Some other papers have theoretically studied the implications of market power (Liu et al., 2022; Lopez-Salido et al., 2021).

In contrast, the literature on the asset pricing implications of market power is more limited. Notable exceptions are Corhay et al. (2020) and Corhay et al. (2022) who study the implications of market power and markup shocks for stock prices.[4] However, to the best of our knowledge, we are the first to study the interaction between inflation, market power, and asset prices.

Implications of Inflation. Our paper also links to the literature on the implications of inflation for economic agents. A large literature studies how inflation expectations of affect households and firms, see e.g. Bachmann et al. (2015); Coibion et al. (2018),[5] and suggests that both individuals and firms often associate higher inflation with worse economic outcomes (Andre et al., 2022; D'Acunto et al., 2023; Candia et al., 2022). Instead, in this paper we aim to infer the perception of inflationary news for stock market investors by measuring the market response to high frequency news about inflation.

[4] Relatedly, Weber (2015) and Gorodnichenko and Weber (2016) study the impact of nominal rigidities for stock prices.

[5] See Weber et al. (2022) for a review.

Our results suggest that stock market investors also have a stagflationary view of the world, as they expect nominal growth of cash flows to be stagnant with the discount rate to increase when inflation surprises to the upside.

Policy Discussion. We also contribute to the public debate on the interaction between market power and inflation. For instance, President Joe Biden tweeted on May 13, 2022: "You want to bring down inflation? Let's make sure the wealthiest corporations pay their fair share". More explicitly, Senator Elizabeth Warren, argued "Concentration results in market power & corporations use it to jack up prices & profiteer during inflationary times.", citing Bräuning et al. (2022) as evidence that concentration increases the pass-through of costs to prices. Instead, we test more formally the second claim that firms benefit from inflationary times. While we do not find that firms with a large degree of market power have positive stock returns when inflationary news is announced, they perform significantly better.

2 Data

2.1 Inflation News

Our inflation analysis is based on Consumer Price Index (CPI) releases which are published by the Bureau of Labor Statistics. We focus on month-on-month headline CPI. Releases are usually published on the second week of the month for the CPI values of the previous month. We construct a measure of inflation news with each inflation release by subtracting an estimation of inflation expectations from the actual inflation release:

$$\text{Inflationary News}_t = \pi_t - E_{t'}\left[\pi_t | \mathcal{I}_{t'}\right] \tag{1}$$

where π_t is the release value of the headline month-on-month CPI, and $E_{t'}\left[.|\mathcal{I}_{t'}\right]$ is the condition expectation just prior to the release based on available information $\mathcal{I}_{t'}$ at $t' < t$. To measure conditional expectations, we use Bloomberg median forecasts for each inflation release, which are available from 1997, and supplement this with the median from Haver Analytics's Money Market Services (MMS) survey, which extends the sample back to 1977.

Figure B.1 plots the inflationary news in red. The surprise series does not exhibit a particular trend, which is reassuring from a statistical perspective, and suggests that the data is stationary. However, there are periods when the surprises were larger in absolute values. For instance, in the early

1990s inflation first surprised the upside and later to the downside. During and shortly after the global financial crisis, the inflationary news was also larger, potentially because the global financial crisis and the accompanying monetary policy actions increased uncertainty about the effects of inflation. Since the COVID-pandemic, as is well known, inflation increased persistently to the upside.

2.2 Stock Returns

We obtain U.S. firm-level stock returns from CRSP (Center for Research in Security Prices). We follow standard procedures and use ordinary shares traded on the NYSE, AMEX, and NASDAQ exchanges. We also adjust returns for splits, mergers, or other corporate actions, and trim at the top and bottom 0.5% to mitigate the effcts of outliers on our results.

Figure B.1 plots the one-day stock return of the average firm on days of inflation announcements together with the inflationary news. Similar to the inflationary news, the one-day stock returns do not exhibit a particular pattern and while a negative correlation between the two series is not immediately obvious, a simple univariate regression of the average stock return on the inflationary news returns a coefficient of -0.22 and a standard error of 0.08 rendering the relationship between inflationary news and stock returns statistically significant at conventional levels. Economically, a one percentage point inflationary news is associated with a 0.22 % decline in the stock price of the average firm. Figure B.2 also confirms the relationship in a binscatterplot.

2.3 Observable Inputs for a Stock Return Decomposition

Under the present value formula for the stock market, an unexpected stock return return must be due to either changes in expected future real cash flows or changes in future real required returns (discount rates), or both. As set out in Knox and Vissing-Jorgensen (2022), in modern financial markets a lot of information on stock market discount rates and cashflows are observable today, and we can use the following data inputs to implement a stock market decomposition of stock returns:

$$\text{Stock return}_{t+1} = \underbrace{\text{Yield curve return}_{t+1}}_{\text{TIPS, swaps}} + \underbrace{\text{Equity risk premium return}_{t+1}}_{\text{Equity option prices}} + \underbrace{\text{Cashflow return}_{t+1}}_{\text{Dividend futures}}$$

into a discount rate component (yield curve return plus equity risk premium return) and a cashflow component.

For yield curve news, we obtain real Treasury yields from the from the Federal Reserve website[6]

[6]https://www.federalreserve.gov/data/tips-yield-curve-and-inflation-compensation.htm

which provides real yields for 2-year through to 20-year maturity that are estimated from Treasury inflation-protected securities (TIPS) yields (Gürkaynak et al., 2010b). The data also provides nominal interest rates and implied breakeven inflation, which is the difference between real yields and nominal yields for a given maturity, as well as instantaneous forward rates. The sample begins in 1999, 2-years after the first TIPS was issued by the U.S. Treasury. We supplement the TIPS yields data with the real yields computed from fixed interest rate swaps and inflation swaps as robustness. This data is taken from Bloomberg and begins in July 2004.

For equity risk premium data, we use the Martin (2017) lower bound of 1-year equity risk premium. The equity risk premium is calculated from option prices obtained from OptionMetrics, the sample of which begins in 1996.

We obtain data on dividend futures, which are claims to dividends on the aggregate stock market in a particular year, from Bloomberg. S&P500 dividend futures for claims on dividends 5 calendar years ahead begin in 2016, and in 2017 the maturity was then extended to claims on dividends in the 10 calendar years ahead. From 2017, each year on the third Thursday of December, a new dividend future is issued that is a claim on dividends in the calendar year 10-years from that year, so that the maximum maturity is always approximately 10-years.

Dividend futures prices are risk-neutral expectations of nominal cashflows on the stock market. Following Knox and Vissing-Jorgensen (2022), we adjust the price series for equity risk premium using the Martin (2017) lower bound for equity risk premium to generate estimates for expected nominal cashflows. We then adjust for expected inflation implied by inflation swaps to get a measure of real expected cashflows. As is standard in the literature, we linearly interpolate across calendar year future prices on every day to generate time series of constant-maturity dividend futures prices and constant-maturity dividend expectations.

2.4 Market Power

In microeconomic textbooks product market power is defined as firms' abilities to influence the price at which they sell their products and use this ability to hold prices over marginal cost, as they do not face perfectly elastic residual demand curves (Pindyck and Rubinfeld, 2014; Goolsbee et al., 2012). The price-marginal-cost gap at the firm's profit-maximizing output level is typically called the markup Syverson (2019).

We estimate markups using the so-called production approach, which was invented with industry-level data by Hall (1988, 2018) and advanced with firm-level data by De Loecker and Warzynski (2012) and De Loecker et al. (2020). Under an assumption of cost minimization, the firms' markup is defined as the product of the revenue to expenditure share of a given variable input times the output elasticity of that variable input.[7]

From the cost minimization problem,

$$\theta^{\nu}_{i,t} = \frac{1}{\lambda_{i,t}} \frac{P^V_{i,t} V_{i,t}}{Q_{i,t}} \tag{2}$$

where $\theta^{\nu}_{i,t}$ is the output elasticity of input $V_{i,t}$, λ the Lagrange multiplier from the cost minimization which measures the marginal costs, $P^V_{i,t}$ is the price of the variable input, and $Q_{i,t}$ is the output.

The markup can be defined as

$$\mu_{i,t} = \frac{P_{i,t}}{\lambda_{i,t}} \tag{3}$$

where $P_{i,t}$ is the output price. Hence, the markup is equal to the output elasticity times the inverse of the variable input's revenue share:

$$\mu_{i,t} = \theta_{i,t} \frac{(P_{i,t} Q_{i,t})}{(P^V_{i,t} V_{i,t})} \tag{4}$$

Following De Loecker et al. (2021) we calculate markups using firm-level data from Compustat North American fundamentals, a dataset of firm-level financial statements for North American publicly traded companies. The data allows us to implement the production approach for estimating markups. We use the cost of goods sold (COGS) as our measure for variable inputs, $(P^V_{i,t} V_{i,t})$ and sales for revenues $P_{i,t} Q_{i,t}$. This leaves us with estimating a measure of output elasticities. As in De Loecker et al. (2021) output elasticities are estimated on the (2-digit) sector level using a parametric production function estimation, with a variable input bundle and capital as inputs.

There is a large discussion around the validity of estimating markups using the production approach (Raval, 2020; Bond et al., 2021; Basu, 2019; Berry et al., 2019; Syverson, 2019; Doraszelski and Jaumandreu, 2021). For instance, De Ridder et al. (2021) use firm-level administrative production and pricing data and show that the level of markup estimates from revenue data is biased, but estimates do correlate highly with true markups. As we do not attempt to either contribute to the markup estimation literature or evaluate the level of markups in the economy, but instead study the

[7] Alternative approaches are the accounting approach and the demand system estimation approach. The problem with the accounting approach is the difficulty of measuring marginal costs, while the demand estimation approach requires data on prices, which we do not have available.

consequences of markups across firms in an asset pricing setting, the production function estimation approach is to the best of our knowledge the most appropriate and feasible way to do so.

2.5 Other Firm-Level Financial Data

We obtain firm-level financial data from Compustat for controls in the analysis. We use firm size (log of total assets (AT)), the book equity (CEQ) to market equity (PRCC*CSHO/1000) ratio,[8] tangibility (the ratio of tangible assets (PPENT) to total assets) and leverage (the ratio of current debt (DLC) and the long-term debt (DLTT) to total assets).

Motivated by the cross-sectional asset pricing literature, we control for firm-level exposures to factor portfolio returns. We use the Fama and French (1993) 3-factor portfolios, Fama and French (2015) 5-factor portfolios, and the Carhart (1997) momentum factor. We obtain these asset pricing factors from Kenneth French's website. We implement factor controls using a Fama-Macbeth approach. In the first step, we compute rolling 5-year betas of each stock in the sample with respect to the factor portfolios. We then include the estimated rolling betas, lagged one period, as control variables in the main regression specifications.

3 Empirical Strategy

3.1 Aggregate Stock Returns

Our empirical strategy relies on an event-study approach that examines the financial market variables around the announcement of a CPI release. The event study approach has the advantage that the market reaction on particular release days is likely due to the inflation itself rather than other confounding factors that could influence the performance of equities. For instance, in a simple time-series regression in which stock returns are regressed on inflation, many confounding factors could be the reason for the market reaction that is not due to inflation itself.

We start with event-study local projections (Jordà, 2005) by estimating the following sequence of regressions for all $k \in [-5, 10]$ across CPI dates from 1977 until 2022:

$$Return_{i,t}^{k} = \alpha^{k} + \beta_{1}^{k}\text{Inflationary News}_{t} + \epsilon_{i,t}^{k} \tag{5}$$

[8]The market equity is obtained from CRSP variables. We merge year-end values with the Compustat book equity

where the cumulative stock return on firm i between the day before the announcement and k days after the announcement is $Return^k_{i,t}$ and inflationary news is defined in equation (1). Standard errors are clustered at the firm and day level. β^k_1 is the effect of inflationary news on the equal-weighted stock price k days after the CPI release.

3.2 Stock Return Decomposition

To better understand the drivers of stock return following inflation news, we estimate the following series of event-study regressions for all $k \in [-5, 10]$ across CPI dates:

$$\Delta_k y_t = \alpha^k + \beta^k_1 \text{Inflationary News}_t + \epsilon^k_t \tag{6}$$

where $\Delta_k y_t = y_{t+k} - y_{t-1}$ is the k-day change in observable discount rates or, where available, observable expected cashflows on the aggregate U.S. stock market around inflation releases on the morning of day t. Estimation sample periods vary on the availability of the input measure. Discount rate data is available from 1999 while dividend futures, which can be used to extract expected dividends, begin in 2016. Estimations of Equation 6 shed light on how investor expectation's of future returns and future cashflows change in response to inflation news.

We next consider how these changes in investor expectation's translate into total realized returns on the stock market, decomposing stock returns into discount rate news and cashflow news using a two-stage estimation approach. In the first stage, we estimate the following series of regressions for all $k \in [-5, 10]$ across CPI dates:

$$Return^k_t = \alpha^k + \Delta_k \mathbf{RF}'_t \Theta^k + \beta^k_E \Delta_k ERP_t + \epsilon^k_{i,t} \tag{7}$$

where $\mathbf{RF}_t$ is a vector of risk-free rates across various maturities of the yield curve, Θ is the vector of estimated regression coefficients on changes in risk-free rate yields, ERP_t is the observable Martin (2017) equity risk premium, β_{ERP} is the estimated regression coefficient on changes in equity risk premium, and the cumulative stock return on firm i between the day before the announcement and k days after the announcement is $Return^k_{i,t}$. In the baseline estimations, the risk-free rate vector, $\mathbf{RF}'_t$, contains the 2-year and 10-year nominal yields, or 2-year and 10-year real yields if we are interested in real return decomposition.

From this first-stage of the two-stage approach, we extract the predicted component of realized returns that are due to observed changes in risk-free rates

$$\widehat{Return}_t^{k,RF} = \Delta_k \mathbf{RF}'_t \hat{\Theta}^k,$$

and the predicted component of realized returns that are due to observed changes in equity risk premium,

$$\widehat{Return}_t^{k,ERP} = \hat{\beta}_{ERP} \Delta_k ERP_t,$$

and from this we define the contribution of the total discount rate component to realized returns as,

$$\widehat{Return}_t^{k,DCR} = \widehat{Return}_t^{k,ERP} + \widehat{Return}_t^{k,RF}.$$

Hence, the residual $\epsilon_{i,t}^k$ can be defined as the predicted component of realized return that are due to changes in investors' expectations of future cashflows:

$$\epsilon_{i,t}^k = \widehat{Return}_{i,t}^{k,CF}$$

as this component of the stock returns has removed all predicted return variation that are due to observable changes in discount rates, and, under the present value identity, total returns must either be due to discount rate changes or cashflow changes.

In the second stage of the two-stage approach, we then estimate the following sequence of regressions for all $k \in [-5, 10]$ across CPI dates:

$$\widehat{Return}_{i,t}^{k,c} = \alpha_{k,c} + \beta_1^{k,c} \text{Inflationary News}_t + \epsilon_t^{k,c} \tag{8}$$

where $\widehat{Return}_{i,t}^{k,c}$ is the predicted c-component of the k-day aggregate stocks returns, and each $c = \{DCR, RF, ERP, CF\}$ return component is estimated in the first stage equation (7) with the return components as follows: DCR is the total discount rate component, RF is risk-free rate component of discount rates, ERP is equity risk premium component of discount rates, and CF is the cashflow component. The restrict the sample period for estimation of Equation 8 for dates where both nominal and real observable discount rate data is available (from 1999 until 2022).

In our baselines estimates, we use the 2-year and 10-year nominal yields in the risk-free rate vector $\mathbf{RF}_t$. This approach parsimoniously captures variation in yields across all maturities of the yield curve with these two yields capturing the level and the slope of the yield curve, which are the first two components of PCA on the yield curve and typically explain over 98% of yield curve variation across all maturities (Litterman and Scheinkman, 1991). Similarly, Equation 7 captures all variation in unobserved risk premium movements beyond the one-year maturity that are correlated with the observed one-year equity risk premium. This is a benefit of our regression-based approach for extracting the total impact of equity risk premium on stock returns given the data limitation that long-dated maturities of equity risk premium are unobserved in daily data.

The main identifying assumption of the analysis is that the discount rate variables used in Equation 7 capture all discount rate changes that impact on aggregate stock returns in our event-window estimations. The assumption is analogous to a variance decomposition of stock returns (Campbell, 1991), where the choice of variables included in the VAR determines how the model apportions returns between discount rate and cashflows news (Campbell, Polk and Vuolteenaho, 2010; Engsted, Pedersen and Tanggaard, 2012). Note also that the predictor variables typically used in variance decomposition of stock returns are not commonly available in high-frequency. Our approach, by utilizing observed changes in expected returns that are available contemporaneously, therefore allows us to maintain the identification benefits of an event-study estimation while decomposing the drivers of stock returns.[9]

3.3 Cross-Sectional Analysis

The estimations in Equation 5 and Equation 8 ignore cross-sectional dimensions of returns across firms. To test for the cross-sectional heterogeneity across firms with differential degrees of market power, we estimate the following regressions for all $k \in [-5, 10]$ across CPI dates:

$$Return_{i,t}^{k} = \alpha^{k} + \beta_{1}^{k}\text{Inflationary News}_{t} * Markup_{i,y(t)-1} + \alpha_{i}^{k} + \alpha_{t}^{k} + \mathbf{X}_{i,t}'\gamma^{k} + \epsilon_{i,t}^{k} \tag{9}$$

where we interact the inflationary news with our measure of markups, as defined in section 2, over the year, $y(t)$, prior to the inflation release, $y(t)-1$. The interact coefficient indicates whether, in response to inflationary news, firms with higher (one-year lagged) markups respond deferentially compared to their counterparts. A positive coefficient is associated with an over-performance of firms with higher markups in response to inflationary news. The specification in which we exploit cross-sectional heterogeneity across firms allows us to include time-fixed effects in our regression equation.

[9]To decompose the stock return response to monetary policy shocks, Bernanke and Kuttner (2005) aggregate monetary policy shocks to a monthly frequency before implementing a standard monthly variance decomposition of stock returns with the VAR augmented with monetary surprises timeseries included as an exogenous variable.

Time-fixed effects (denoted by α_t^k) control for all unobserved and observed heterogeneity at a given point in time, such as changes in the monetary policy stance, volatility, economic news, or other factors such as sentiment, which are econometrically harder to observe. If these factors were to be correlated with the interaction term $\textit{Inflationary News}_t * Markup_{i,y(t)-1}$, the exclusion of time fixed could bias the coefficient of interest β_1^k of equation Equation 9. Moreover, we include firm fixed effect in the regression specification (α_i^k), which control for time-invariant characteristics of the firm.

We also include various other characteristics $\mathbf{X}_{i,t}$ as control variables. One potential threat for identification is if firm characteristics are correlated with markups and also react differentially with respect to inflationary news. For instance, if firms with smaller sizes are less responsive to inflationary news than large firms, and firm size is correlated with markups, our coefficient of interest could be biased. To control for the differential impact of various firm-level characteristics on inflationary news we interact various firm-level characteristics, such as log assets, tangibility, leverage, and market-to-book value with inflation news. Given our dependent variable is stock returns, we can also control for firm characteristics by capturing firm stock return's risk exposure to asset pricing factor models.[10] Using a Fama-Macbeth approach, we first compute rolling 5-year stock beta's to the portfolio factors, and then include the estimated firm-level betas in the control vectors and, as with firm characteristics, interact with the inflationary news variable.

One limitation of the interacted firm-control approach is that unobservable time-varying factors cannot be controlled for. If $firm \times time$ fixed effects were to be included in the regression equation, they would be collinear with the *markup* $\times$ *inflationary news* term. However, we can make some progress toward controlling for a certain degree of time-variant variation that differs across firms to compare firms within each industry by including $industry \times time$ fixed effects. The results are shown in column (3).

A further benefit of estimating a regression equation with $industry \times time$ fixed effect is that alleviates a potential concern with the markup estimation by De Loecker et al. (2020). The estimation of industry-level output elasticities can produce inconsistent estimates of the output elasticity and the disturbance, and therefore can generate biased markups (Doraszelski and Jaumandreu, 2021). By controlling for $industry * time$ fixed effects, we partially out the sector-specific output elasticities and solely compare firms with differential markups within an industry.

Note that in contrast to standard local projections, we also consider $k < 0$ in the spirit of an

[10]In the baseline we use the Fama and French (1993) asset pricing model, but results are also robust to using Fama and French (1993) plus Carhart (1997), or to using the Fama and French (2015)

LP-DID proposed by Dube et al. (2023). One difference between the LP-DID and the standard DID is that a sequence of regressions are estimated for each k. This has the advantage that β^k is unaffected by the choice of the number of lags and leads included. Moreover, the LP-DID avoids several other problems compared to estimating a difference-in-differences specification with two-way fixed effects, see e.g. Callaway and Sant'Anna (2021); Goodman-Bacon (2021) among many others.

For the difference-in-differences estimator to be unbiased, we require the parallel trend assumption to be satisfied—that is, absent a shock, treated and control firms would have evolved the same way. While it is not possible to test this assumption, as the counterfactual post-CPI release behavior without the shock is unobservable, we can test for whether there are differential pre-trends before the shock. Estimating β^k for $k < 0$ allows us to test whether there is a violation of the parallel trend assumption.

Recent literature has argued that DID designs are likely to be biased in the presence of a staggered DiD approach as already treated units can act as effective comparison units (Baker et al., 2022). Note that this is not a concern in our setting as we set $k =\in [-5, 10]$, covering only a window of 15 days, which prevents overlapping observations and staggered treatment, as CPI releases only occur once a month. The concern would be that firms with higher markups are treated for one CPI release but not for the next, but still being treated as comparison units for the next one.

4 Results

4.1 Inflationary News Across All Firms

Figure 1 plots the regression coefficient β^k of Equation 5 from $k = -5$ to $k = 10$. The coefficient for k=0 represents the effect of inflationary news on the one-day return of the average stock on the day of the CPI announcement, whereas the one-day return is defined as the difference between the close price of the day of the announcement and the close price of the day before the announcement. Note that the announcement of the CPI release happens at 8:30 am when the market is still closed. For robustness, we also test for the difference between close and open prices, and all results are unchanged.

The negative coefficient, represented by the square at day=0, of 0.8 shows that in response to a one percentage point inflationary news, stock prices fall by around 0.8%. The shaded area in blue reflects the 95% confidence interval around the point estimate, ranging from around 0.1% to 1.6%, indicating statistical significance at conventional levels.

Moving to the next day ($k = 1$), shows that the negative effect of inflationary news on the stock market increases. The coefficient indicates that stock prices fall by around 0.9% between the day before the announcement of the CPI and two days after. The effect after the second day remains persistent and if anything strengthens over a period of 10 days.

Importantly, before the announcement of inflationary news, stock returns do not exhibit a trend, as shown by the statistically insignificant coefficient for $k = -2$ to $k = -5$. This absence of a pre-trend suggests that the parallel trend assumption is more likely to hold, which refers to the idea that in a difference-in-differences analysis, the trend in stock prices would have been the same in the absence of inflationary news.

The results for the (absence of a) pre-trend, the contemporaneous effect, and the lagged effect are also summarized in the binscatter plots of Figure B.2 in which the x-axis is the inflationary news. The left panel shows a binscatterplot where the y-axis is the contemporaneous (one-day) stock return, the middle panel shows the return over a period of five days, and the right panel shows the one-day return the day before the inflation announcement. The left and middle panels both show a strong negative relationship between the inflation surprise and the return over one and five days, respectively. Consistent with the results above, the relationship becomes stronger (more negative) over five days compared to when only one day's return is considered. The right panel can be seen as a placebo test. If the inflationary news was to be expected, one would potentially already see that stock returns are negative before the announcement. However, the absence of a relationship between inflationary news and stock returns the day before suggests that what we call inflationary news is indeed news and is not yet expected by the market.

4.2 Decomposing Stock Returns Across All Firms

In this subsection, we aim to better understand the channels through which inflation news impact stock returns across all firms by disentangling returns into cashflow news and discount rate news components. The present value formula of the stock market states that the market price today is the sum of the present value of all the future cash flows generated by the stock market and thus, under this formula, stock market returns must result from either changes in expected future real cash flows or changes in future real required returns, or both. Motivated by the insight of Knox and Vissing-Jorgensen (2022) that a lot of information on stock market discount rates and expected cashflows are observable today in modern financial markets, we can study how these individual components move in response in inflationary news.

4.2.1 The real yield curve and inflation shocks

We begin by considering the impact of changes in the real yield curve in response to inflation shocks. This approach allows us to estimate investor expectations of the Taylor Rule in response to changes in inflation expectations in real time.[11] We then estimate how these might impact realized stock market returns across firms, that is, the risk-free return component of discount rate news on stock returns. Column 1 of Figure 2 presents results for the 2-year nominal Treasury yield, the 2-year breakeven inflation rate, and the 2-year real Treasury yield, and column 2 of Figure 2 presents results for the 10-year nominal Treasury yield, the 10-year breakeven inflation rate, and the 10-year real Treasury yield. Each figures plots the regression coefficient β^k of Equation 6 from $k = -5$ to $k = 10$ and is estimated over the sample period 1999-2022.

The positive coefficients of 0.11 and 0.27 at day 0 for 2-year nominal Treasuries and 2-year breakeven inflation respectively show that in response to a one percentage point inflationary news, the 2-year yields rise by 11 basis points and inflation expectation rise by 27 basis points on that day.[12] Under a Taylor rule framework, the response of monetary policy - and therefore short-dated nominal interest rates - should exceed the change in inflation. From this perspective, real yields should increase in response to inflationary news, which could then be responsible for a decline in the stock market. However, empirically, we find the increase in nominal yields to be driven by increases in inflation expectations, i.e. the increase in breakeven inflation is larger than that of nominal treasury yields, which is inconsistent with the Taylor rule hypothesis. Combining the result on nominal yields and inflation expectations translates into the result in the bottom left figure, where we see real yields decline, instead of increase, as the Taylor rule would predict, in response to inflationary shocks. In particular, the negative coefficient of 0.16 shows that the 2-year real Treasury yields decline 16 basis points in response to a one percentage point inflation news.

In the second column of Figure 2 we turn our focus to the 10-year maturities. Longer-maturity discount rates are in fact more pertinent for understanding the impact of real yields on stock market returns given the duration of the stock market is very long (van Binsbergen, 2020; Knox and Vissing-Jorgensen, 2022).[13] At the 10-year maturity, the change in nominal Treasuries and breakeven inflation are approximately the same, each rising 8 basis points following a one percent point inflation news,

[11] In related recent work, Bauer et al. (2022) study professional forecasters' expectations of the Taylor Rule from surveys.

[12] The notable response of inflation compensation to CPI news is consistent with prior evidence in Bauer (2015).

[13] Knox and Vissing-Jorgensen (2022) show that in recent years over 80 percent of the value of the aggregate stock market comes from the present value of cashflows that are paid in over 10 years from the current date.

and thus in the bottom right figure we see 10-year real yields are approximately unchanged in response to inflation.[14]

The unresponsiveness of long-dated real yields to inflation news contrasts with large and positive response of long-dated real yields to monetary policy shocks (Hanson and Stein, 2015). To further explore these distinctive effects of monetary policy news and inflation news on the long end of the real yield curve, we estimate the Hanson and Stein (2015) main regression specification:

$$\Delta_1 f_t^{10,r} = \alpha_r + \beta_r \Delta_1 y_t^2 + \Delta_1 \epsilon_t^r \tag{10}$$

where $f_t^{10,r}$ is the 10-year $r = \{\text{nominal,real,breakeven inflation}\}$ instantaneous forward rate, y_t^2 is 2-year nominal Treasury yield, and $\Delta_1 x_t = x_{t+1} - y_{t-1}$ is the 2-day change in variable x around an inflation release on the morning of day t. Changes in 2-year nominal yields are used as a measure of monetary policy news that captures surprise changes in both the current federal funds rate and the expected path of the federal funds rate over the next several quarters.

Panel A of Table 2 presents the results from Equation 10 where columns 1-3 shows the estimation on FOMC days. Consistent with Hanson and Stein (2015), but on an extended sample through to 2022, we find a large impact of monetary policy news on long-dated nominal instantaneous forward rates, with this sensitivity driven by the real rate component of the nominal forward rates.[15] Columns 4-6 then shows estimation results on CPI release days. As with FOMC days, there is a large response in long-dated nominal instantaneous forward rates but, in contrast to FOMC days, this sensitivity is driven mostly by the breakeven inflation component of nominal forward rates. For a 100 basis point increase in the 2-year nominal Treasury yield in the 2-days following a CPI release, the nominal instantaneous forward rate increases by 56 basis points, with 40 basis points driven by breakeven inflation, and nominal forward rates only increasing 17 basis points. The dependent variable on CPI days can be interpreted as capturing the expected monetary policy response to inflation news on that day, and thus the results point to fundamental difference between news on CPI release days relative to monetary policy days. In particular, the results indicate that yield moves on CPI release days should

[14] Table A.1 presents analogous results using interest rate and inflation swaps to compute and decompose real yields. TIPS are less liquid than Treasuries (Fleckenstein et al., 2014), and thus one concern could therefore be that time-variation in the TIPS liquidity premium around inflation announcements is driving results. However, we don't find support for this channel, with the results consistent across estimations using swap prices rather than bond prices.

[15] Using different shocks for monetary policy, Nakamura and Steinsson (2018) do not find an impact of monetary policy shocks on 10-year real forward rates, but do find monetary policy effects 5-year forward rates and other shorter maturities of the real yield curve.

not be considered just a monetary policy phenomena, i.e. nominal yields increase *only* because of the expected monetary policy response to higher inflation, and instead there are other forces at play driving changes in yields.

To further explore yield curve dynamics in response to various economic shocks, Table 2 Panel B first estimates Equation 10 on all other days in our sample, i.e. excluding FOMC and CPI release days, and shows that, consistent with Hanson et al. (2021), long-dated nominal instantaneous forward rates are typically highly responsive to moves in short-dated nominal rates, with the majority of the sensitivity driven by the real rate component of the nominal rate, but also a role for breakeven inflation component. More importantly, Columns 4-9 of Panel B Table 2 next shows the results splitting other days into monetary policy news days and growth news days.[16] Strikingly, yield curve dynamics on monetary policy (but non-FOMC) days exhibit very similar behavior as on FOMC days themselves, with nominal forward rates purely driven by real rates. On growth news days, nominal forward rates are mostly driven by real rates, but there is a role for breakeven inflation too. Nevertheless, CPI releases standout, even relative to growth days, as days when the long-end of the nominal yield curve is particularly driven by inflation compensation changes. The results therefore indicate that particular economic channels are at play on CPI days and are consistent, for example, with a model in which long-run inflation expectations are not well anchored and revise in light of incoming inflationary news (Gürkaynak, Sack and Swanson, 2005).

4.2.2 Equity risk premium, nominal cashflows, and inflation shocks

The fact that real yields do not rise following inflation shocks means that yield curve news is not the driver of negative stock returns in response to inflation news.[17] The negative returns must thus be due to one or both of: (a) increases in equity risk premium, (b) stagnant (decreasing) expectations of future nominal (real) cashflows.

We first consider the role of equity risk premium by estimating equation (6) with the Martin (2017) lower bound of the 1-year equity risk premium as the dependent variable. Figure 3 plots the

[16]We split days into two groups conditional on the correlation of yields and stock returns on that day: days when stock returns and yields are positively correlated are labeled monetary policy news days, and days when stock returns and yields are negatively correlated are labeled growth dates. This split follows a recent literature (Cieslak and Schrimpf, 2019; Jarociński and Karadi, 2020; Cieslak and Pang, 2021; Hoek et al., 2022) that uses the intuition that days with a positive correlation between yields and stock returns must contain positive growth news. Increasing yields increase the discounting of expected cashflows and thus, for stock returns to be positive, there must also be positive news about expected cashflows.

[17]Fang et al. (2022) find complementary evidence that stock returns are negative in response to core inflation shocks after controlling for changes in fed fund futures, which explicitly capture any impact of the monetary policy response to the inflation shock on stock returns

full set of regression coefficient β_k of Equation 6 from $k = -5$ through to $k = 10$. The equity risk premium is estimated to increase by 30 basis points in response to a 100 basis point inflation shock the day after the shock, with the response increasing to statistically significant 70 basis points by day 5. The positive coefficients illustrate increasing equity risk premium in response to inflation news (Bekaert and Engstrom, 2010), and therefore provide evidence that equity risk premium news at least partially contributes to the equity price declines observed in response to inflation news.[18]

We next consider the role of cashflows on stock returns using the two-stage estimation outlined in subsection 3.2. In the first stage, the total impact of discount rates changes (both risk-free rates and equity risk premium) on firm stock returns is estimated in equation (7) from $k = -5$ to $k = 10$. The regression is designed to absorb all variation in stock returns that are due to observable discount rates, leaving an estimated regression residual. We call the residual the predicted cashflow component of the k-day stock return, $\epsilon^k_{i,t} = \widehat{\text{Return}}^{k,CF}_{i,t}$, as it captures stock returns that are unexplained by the changes in observable discount rates. We then regress predicted cashflow component on inflation news, with Figure 4 plotting the estimated coefficient β^k of equation (8) for from $k = -5$ through to $k = 10$. The results shows how the estimated nominal cashflow component of stock returns is close to zero, indicating that investors' expectations of cashflows are stagnant in response to inflation shocks.

4.2.3 Decomposing realized real returns

Inflationary news, as defined in Equation 1, results in an instantaneous increase in the level of the consumer price index. This instantaneous increase becomes a permanent increase if, following the inflationary shock, the price index is not expected to decrease. In fact, as we have shown in Figure 2, inflation expectations are increasing (no decreasing) with inflationary surprises. Inflation news is therefore associated with a permanent increase in the consumer price index, which means the nominal stock returns shown in Figure 1 are even more negative when considered on a real basis.

In particular, once inflationary news are released, the real stock return is proportionately lower than the nominal stock return. For instance, if inflation is 1 percentage point higher than was expected, this can be thought of a instantaneous increase in the price level of 1 percentage, and implies that the real stock price is lower by the same amount at the time of the inflation release. We therefore calculate real returns around inflationary news by simply subtracting the inflationary shock from the

[18] Boehm and Kroner (2023) also find evidence of increasing equity risk premium for a broader set of U.S. macroeconomic announcements.

nominal stock return,

$$\widetilde{Return}^{k}_{i,t} = Return^{k}_{i,t} - \text{Inflation news}_t,$$

for all days since the inflationary news (i.e. for all $k \geq 0$). If investors truly viewed the stock market as a real asset, in the sense that the cashflows generated by the asset increase with the price-level in the economy, then one could suppose that nominal expectations of all future cashflows increase with the instantaneous level-shift in the consumer price index that is associated with the inflation surprise. Thus, even holding investors' discount rates and investors' expectations for future cashflow *growth* fixed in response to inflation news, this price-level adjustment to expected nominal cashflows means an inflation shock would lead to a nominal stock market return equal to the size of the inflation shock itself. Subtracting the realized inflation shock from the nominal stock returns thus removes this potential impact of changes in perceptions of the price-level on expected nominal cashflows.

With the realized real stock returns around inflation news, we estimate Equation 7 in real terms,

$$\widetilde{Return}^{k}_{i,t} = \alpha^k + \Delta_k \widetilde{\mathbf{RF}}'_t \Theta^k + \beta^k_{ERP} \Delta_k ERP_t + \tilde{\epsilon}^k_{i,t}, \tag{11}$$

where the discount rate controls now include the a vector of *real* risk-free rates, $\widetilde{\mathbf{RF}}_t$, and the equity risk premium, ERP_t. Because we control for real risk-free rates, rather than nominal risk-free rates, in this estimation the residual, $\tilde{\epsilon}^k_{i,t}$, is the predicted component of realized returns that are due to investors expectations of future *real* cashflows,

$$\tilde{\epsilon}^k_{i,t} = \widehat{Return}^{k,\widetilde{CF}}_t,$$

with real risk-free yields embedding the impact of changes in investor inflation expectations in the discount rate component of the realized return.

Figure 5 presents a decomposition of realized real stock returns into return components around inflation surprises. The figure stacks the return contribution of real cashflows, real risk free rates and equity risk premium on the aggregate stock return, as well as presenting the aggregate real stock return with the black line.[19] Formally, the bars plot the full set of estimated regression coefficients $\beta^{k,c}_1$

[19]The aggregate stock return shown in Figure 5 is more negative than shown in Figure 1 due to the realized inflation adjustment to realized returns but also because in this sub-sample where discount rate data is available (from 1999) the nominal stock are more negative in response to inflation news. For example, the nominal return for $k = 0$ is -1.3% in the discount rate sample estimation (compared to -0.8% in the full sample), and the nominal return for $k = 5$ is -2.9% in the discount rate sample estimation (compared to -1.8% in the full sample)

of Equation 8 from $k = -5$ through to $k = 10$ and for $c = \{\widetilde{CF}, ERP, \widetilde{RF}\}$ where the coefficients for each k are stacked across c. The dependent variables are the predicted return components, $\widehat{Return}_{i,t}^{k,c}$, of the cumulative k-day return on the stock market that are estimated from Equation 11 as described previously. The return components are the returns generated from changes in real cashflow expectations, $\widetilde{CF}$, changes in equity risk premium, ERP, and changes in real risk-free rates, $\widetilde{RF}$. Because k-day return components sum to the k-day aggregate return, the sum of the regression coefficients of return components on inflation news equal the regression coefficient of aggregate stock returns on inflation news by definition.

Focusing first on the equity risk premium component of real stock returns, we estimate that increasing equity risk premium contributes 0.7 percentage points to the negative 2.3 percent points return of the stock market on day $k = 0$, and contributes 1.7 percentage points to the -3.8 percentage points cumulative return on the stock market to day $k = 5$. The equity risk premium therefore accounts for 30 percent of the negative stock return on the day of an inflation announcement and up to 48 percent of the cumulative return through to $k = 5$. An advantage of the two-stage regression approach for the return decomposition we are implementing is that the coefficient on 1-year equity risk premium in the first stage Equation 7 estimation not only captures the impact of changes in the observed 1-year equity risk premium on the stock market price, but also the changes in unobserved longer maturity equity risk premium changes (providing that the longer maturity equity risk premium are correlated with 1-year equity risk premium). Indeed, for $k = 0$ we estimate a regression coefficient of -2.4 on 1-year equity risk premium in Equation 7. If unobserved forward equity risk premium beyond the 1-year maturity were unchanged following inflation news, the coefficient would only be -1, and thus the regression coefficient less than minus one shows that our estimation captures a significant contribution from implied changes in unobserved equity risk premium beyond the 1-year maturity.

Turning next to the contribution of real risk-free rate return component, we see that the small changes in real risk-free rate documented in Figure 2 unsurprisingly lead to a small contribution from risk-free rates on aggregate stock returns. For $k = 0$, increases in long-dated real yields mean that risk-free return component contributes 0.2 percentage points to the -2.3 percentage points negative stock return (this is 6 percent of the overall return), and for $k = 5$ the real risk-free rate contribution is even positive with long-dated real risk free rates very slightly increasing.

Finally, we look at the contribution of investors' expectations of future real cashflows on negative stock returns following inflation news. Even after controlling for the large move in equity risk premium around inflation news, and also controlling for the smaller moves in real risk-free rates, we find there is a large contribution for real cashflow return component. In particular, the decline in investor expectations of real cashflows contribute -1.4 percentage points to the -2.3 percent point return on day $k = 0$, and contribute -2.0 percentage points to the -3.8 percentage point cumulative return to day $k = 5$. We therefore estimate that changes in investors' expectations of future real cashflows accounts for 63 percent of the negative stock return on the day of an inflation announcement, and 52 percent of the cumulative return through to $k = 5$.

4.2.4 Evidence from Dividend Futures

We explore further by considering how dividend futures respond to inflation shocks in the later sample (2016-2022) where dividend future prices are available from Bloomberg. Although on a smaller sample period, these provide a more direct measure of investor's expectations of cashflows on the aggregate stock market. For example, Gormsen and Koijen (2020) show how dividend futures prices fell significantly during the onset of the Covid crisis as investors revised down their growth expectations.

Table 3 Panel A presents log changes in the constant-maturity 1-year and 2-year dividend futures price around inflation news. It presents 1-day changes and 5-days following inflation announcements, and for each window presents both nominal and real changes. For real changes, dividend future prices are discounted by expected inflation of the same maturity (as measured from breakeven inflation rates) so that they adjusted from nominal to real quantities, and changes are adjusted for the inflation news that reflects an immediate change in the economy price-level. Table 3 Panel A shows that nominal dividend futures are close to unchanged following inflation news, while real cashflows exhibit a statistically significant declines. For example, following a 100 basis points inflation shock, the 1-year dividend future declines by 162 basis points that day on a real basis. The results from dividend futures are consistent with the previous analysis extracting cashflow news from the two-stage regression estimation.

Dividend futures are in fact risk neutral expectations of cashflows on the stock market and thus the dividend futures price declines could partially reflect increases in risk premium following inflation news. Following Knox and Vissing-Jorgensen (2022), we therefore adjust dividend futures prices for the Martin (2017) lower bound of equity risk premium at the same maturity, which generates a lower bound of expected dividends. The results of regressing these adjusted dividend futures prices on inflation news are presented in Table 3 Panel B, with the key takeaways broadly the same as in Panel A: nominal cashflow expectations are unchanged following inflation news while real dividend expectations decline significantly.

4.3 Inflationary News and Market Power

Next, we aim to understand how the effect of inflationary news on stock returns differs between firms that have high markups as compared to those firms that have low markups. Firms that have a higher degree of market power, measured by their markups, may be able to pass higher prices into their products relative to their counterparts that do not have a large degree of market power, due to differential elasticities of demand. A firm that has a large degree of market power faces a lower demand elasticity, making customers less likely to switch in response to rising prices. In contrast, firms that have no or only a small degree of market power may lose customers to competitors or face resistance from customers who are unwilling to pay the higher prices if they raise them.

We split the sample of firms into those that have high and low markups. High markup firms are those that have at any given point in time markups above the 75th percentile of the markup distribution while those with low markups are those with markups below the 25th percentile of the distribution. We estimate the following equation:

$$\begin{aligned} Return^k_{i,t} = & \alpha + \beta_1 \text{Inflationary News}_t * \text{Low Markup}_{i,y(t)-1} \\ & + \beta_2 \text{Inflationary News}_t * \text{High Markup}_{i,y(t)-1} + \beta_3 \text{Low Markup}_{i,y(t)-1} + \epsilon_{i,t} \end{aligned} \tag{12}$$

Figure 6 plots β_1 & β_2 for different ks. In the upper panel, which plots β_1, the effect of inflationary news for low markup firms resembles qualitatively Figure 1, but the magnitudes are larger in absolute values. In particular, firms with low markups see their stock prices decline by around 3.8% in five days after a one percentage point inflationary news shock (compared to 1.9 for the average firm), with the 95th % confidence interval ranging between 1.2 and 5.8. In contrast, firms with high markups see their stock prices declining only modestly in response to inflationary news. Five days after the inflationary news shock, stock prices are down only 0.9% with the 95th % confidence interval touching zero. For firms with high markups, we can therefore reject the null hypothesis that inflationary news leads to declines in stock prices after five days.

We test more formally the difference between firms with differential degrees of market power by estimating Equation 9. Figure 7 plots the interaction coefficient between the inflationary news shock and markups. The interaction coefficient tests whether firms with higher markups exhibit differential stock returns around the announcement of inflationary news.

The results for $k <= 0$ help shed light on whether there is a pre-trend in the data. If firms with higher markups already before the CPI announcement had rising stock prices relative to those with lower markups, this would likely lead to a violation of the parallel trend assumption which implies that both types of firms would have experienced the same return dynamic around the event, had the announcement not been an inflationary news shock.

The close-to-zero and statistically insignificant coefficient that does not exhibit a trend before the CPI announcement, suggests that there is no pre-trend in the data. If there was a preexisting trend, it could be more difficult to determine whether the trend in the returns for the high markup group would have been the same as the trend in the returns for the firms with low markup in the absence of inflationary news, which could lead to biased estimates of the treatment effect.

A positive coefficient on the interaction for $k >= 0$ indicates that firms with higher markups earn higher returns after inflationary news. Since markups are standardized with a mean of zero and a standard deviation of one, the coefficient can be interpreted as the differential impact of inflationary news on firms with a one standard deviation higher markup. The coefficient rises from around 0.18 to 0.31 from the day of the event to five days after the event. Hence, a firm with a one standard deviation higher markup has a 0.31 percentage point higher stock price compared to another firm five days after the event in response to a one percentage point inflationary news shock. Note that the average firm suffers a decline of around 1.9% in response to a one percentage point inflationary news shock so that the interaction coefficient is around 16% of the base coefficient. A firm that has one standard deviation higher markup suffers a decline in the stock price of 1.59% (1.9-0.31) in response to a one percentage point inflationary news shock, a difference of 16% (1-1.59/1.9).

The result is also illustrated in Table 4 for $k = 5$. Column (1) displays the regression result without time-fixed effects, which allows us to estimate the coefficient for the inflationary news on its own. Similarly to Figure 1, the inflation surprise coefficient is -0.09 and the main coefficient of interest, the interaction between markups and the inflation surprise is 0.286. Column (2) introduces time fixed effect in the regression equation. The inclusion of time-fixed effects introduces collinearity with the inflation surprise so that the effect of inflationary news cannot be interpreted anymore. However, the advantage of the inclusion of time-fixed effects is that through its inclusion we control for all unobservable and observable time-variant factors that could bias the result that firms with higher markups earn higher returns than their counterparts in response to inflationary news. Through the inclusion of time-fixed effects we control for the average effect of being in a particular time period and it allows us to make a within-time period comparison. For instance, we can control for any underlying trends in monetary policy, and uncertainty and instead isolate the effect of inflationary news on firms with differential degrees of market power. The coefficient on the interaction between market power and inflationary news remains virtually the same, indicating that time-variant factors that are correlated with the interaction of inflationary news and markup are not driving the results.

Column (3) introduces industry*time fixed effects to not only control for unit-invariant time specific factors but also for industry-specific time-variation that is both observable and unobservable. While the coefficient shrinks slightly in absolute terms, it is still statistically significant.

Columns (4) and (5) introduce interacted firm-level controls to control for potential confounding firm-level characteristics. In column (4) we first rely on balance sheet characteristics from Compustat, Tobin's Q, log assets, leverage, and tangibility, and in column (5) we use firms' conditional beta to the three Fama French factors that are estimated using lagged rolling 5-year regressions. Through the inclusion of the interacted firm-level characteristics, we control for the heterogeneous impact of inflation across the leverage distribution (Bhamra et al., 2023).

Given that increasing equity risk premium is a driver of negative stock returns in the aggregate, the risk-factor betas are important to rule out a potential explanation of the results that is that firms with lower markups are riskier and therefore load more on increasing equity risk premium in response to inflation news. However, the coefficient on the interaction between inflationary news and markup remains stable with these additional controls, indicating neither alternate firm characteristics nor firm's risk exposures are confounding factors.

In sum, we find strong evidence that inflationary news reduces stock prices for a firm that has a limited degree of market power but firms with market power are less severely hit and those that have a substantial degree do not suffer from inflationary news. The stark difference suggests that stock market investors see the impact of inflation on future discounted cashflows of high market power firms more benignly than that of firms that do not have market power.

4.3.1 Real Cash Flows across the Market Power Distribution

In subsubsection 4.2.3 we have shown that declining real cash flow news around inflationary news are an important driver of the decline in stock prices. In this section, we test whether real cash flows expectations are also the driver behind the differences in stock returns across firms with differential degree of market power in response to inflation news. Given that changes in discount rate affect the present value of discounted cash flows, differences in the cashflow duration of firms across the market power distribution would mechanically lead to heterogeneous returns in response to discount rate changes that occur with inflation news. This variation in realized returns, which is purely due to discounting, would occur even if there was no change in expected cashflows across firms in the market power distribution.

To extract the cash flow component of variation in the cross-section of stock returns, we therefore follow a similar two-stage strategy as in subsubsection 4.2.3. In the first stage, we estimate estimate the following series of regressions for all $k \in [-5, 10]$ across CPI dates:

$$\widetilde{Return}_{i,t}^{k} = \alpha_i^k + (\Delta_k \widetilde{\mathbf{DCR}}_t' \times Markup_{i,y(t)-1})\Theta^k + \Gamma_{i,t}\Psi^k + \widetilde{\epsilon_{i,t}^k} \tag{13}$$

where $\widetilde{Return}_{i,t}^{k}$ is the real stock return around the CPI release and firm-level markups, $Markup_{i,y(t)-1}$, are interacted with a vector of discount rates, $\widetilde{\mathbf{DCR}}_t = \left[\widetilde{\mathbf{RF}}_t, ERP_t\right]$, that includes real risk-free rates yields across various maturities, $\widetilde{\mathbf{RF}}_t$, and the Martin (2017) equity risk premium, ERP_t. The regression also includes a control vector, $\Gamma_{i,t}$, that includes firm-level markups, $Markup_{i,t}$, the discount rate vector, $\widetilde{\mathbf{DCR}}_t$, other firm-level characteristics, $\mathbf{X}_{i,t}$: log assets, tangibility, leverage, market-to-book value, rolling betas to Fama and French (1993) asset pricing factors market beta, size, and value. The control vector $\Gamma_{i,t}$ additionally includes interactions between discount rates and firm-level characteristics.

As discussed in subsection 3.2 for the time-series, by absorbing variation in returns related to changes in discount rates, we can then define the real cash flow component of firm-level stock returns around CPI releases as:

$$\widetilde{\epsilon_{i,t}^k} = \widehat{Return}_{i,t}^{k,\widetilde{CF}}$$

and, because Equation 13 does not include the inflation shock itself in the equation, we can now test how this real cash flow component of stock returns respond differentially to inflationary news depending on the degree of market power firms have. To do to so, we estimate in a second stage the following sequence of regressions for all $k \in [-5, 10]$ across CPI dates:

$$\begin{aligned}\widehat{Return}_{i,t}^{k,\widetilde{CF}} =& \alpha + \beta_1 \text{Inflationary News}_t * \text{Low Markup}_{i,y(t)-1} \\ &+ \beta_2 \text{Inflationary News}_t * \text{High Markup}_{i,y(t)-1} + \beta_3 \text{Low Markup}_{i,y(t)-1} + \epsilon_{i,t}\end{aligned} \tag{14}$$

where $\widehat{Return}_{i,t}^{k,\widetilde{CF}}$ is the predicted real cashflow component of the k-day stocks returns. High markup firms are those firms that have at any given point in time markups above the 75th percentile of the markup distribution while those with low markups are those with markups below the 25th percentile of the distribution.

Note that firms across the leverage (Ottonello and Winberry, 2020), markup (Duval et al., 2021;

Liu et al., 2022; Duval et al., 2023), or tangibility (Döttling and Ratnovski, 2023) distribution may exhibit differential sensitivity with respect to changes in the interest rate relative to their counterparts. The differential response of firm returns to inflation shocks may therefore be mediated through an an increase in nominal interest rates (see Figure 2), potentially due to changes in monetary policy expectations, rather than real cash flow expectations directly related to the effect of inflation. It is therefore important that the interaction of firm-level markups (and other firm characteristics) with discount rates in Equation 13 controls not only for the differential impact of changes in discount rates on firm returns through a cashflow discounting channel, but also controls for the potentially differential impact of changes in discount rates on firm returns due to different sensitivities of firm cashflows themselves to the interest rate environment. The response of $\widehat{Return}_{i,t}^{k,\widetilde{CF}}$ to inflation news estimated in Equation 14 should therefore be interpreted as the component of stock returns that are due to changing investor expectations of future real cashflows that, importantly, are *not* changes in cashflow expectations that are due to changes in the interest rate environment that comes with inflation news.

Figure 8 plots β_1 & β_2 for different ks. The left panel plots β_1 the effect of inflationary news on the predicted real cashflow component of stock returns for high markup firms. The coefficient is negative but not statistically significant for most of the horizon, indicating that investors do not expect real flows to decline with inflationary news for firms that do have market power. One possible explanation for this finding is that investors expect firms with market power to raise nominal revenue in line with inflation, i.e. rise prices without losing costumers due to low demand elasticities. In contrast, for firms with a small degree of market power investors expect real cashflows to decline significantly (right panel). With higher inflation firms without market power are unable to raise their revenues with inflation, as they either do not raise prices or if they raise prices, lose a large degree of customers. These results confirm the hypothesis that the differential stock price response for firms across the market power distribution is to a large part driven by cash flow expectations directly in response to higher inflation, rather than through differential effects of changes in discount rates.

5 Conclusion

The historically high levels of inflation in 2022 triggered a debate on the role of market power on rising prices. For instance, President Joe Biden tweeted on May 13, 2022: "You want to bring down inflation? Let's make sure the wealthiest corporations pay their fair share." The claim that price gouging has contributed to the recent inflation has triggered a debate among economists on the role of whether markups have contributed to inflation. In this paper, we approached the question from a slightly different angle. We asked: "How are firms with a differential degree of market power affected by inflation?". In standard models, inflation reflects firms' price changes, leading to higher nominal cashflows. However, not all firms raise prices proportionately with inflation. Firms that have market power do not face a perfectly elastic residual demand curve and can hold prices over marginal costs, potentially leading to differential outcomes during inflationary episodes

Inflation can affect firms with market power in different ways, depending on the specific circumstances of the firm and the market in which it operates. In general, firms with market power may be able to pass on higher costs associated with inflation to their customers by raising prices. This can help the firm maintain its profits or even increase them, as long as demand for its products or services remains strong.

However, there are also potential downsides to raising prices in response to inflation for firms with market power. If the firm raises prices too much, it may lose customers to competitors or face resistance from customers who are unwilling to pay the higher prices. In addition, if the firm raises prices in response to inflation, it may contribute to further inflation in the economy, which can have negative consequences for consumers and the overall economy.

It is important for firms with market power to carefully consider the potential trade-offs associated with raising prices in response to inflation and to balance the need to maintain profits with the need to remain competitive and responsive to customer demand.

In this paper, we provide evidence that inflationary news significantly reduces stock prices. When decomposing stock returns in a risk premia, the risk-free rate, and cash flow news, we show that the stock market has a stagflationary view of the world: It expects lower future real cashflows from companies. When exploiting heterogeneity across firms, we find a significant difference between firms that have a high degree of market power compared to those that do not. Firms that have significant market power are not expected to have declining cashflows in response to inflationary news while firms that do not have pricing power are not expected to raise revenues proportionately with inflation. Firms that have market power can raise prices in response to positive demand shocks of households, being able to raise their cashflows relative to those that do not have market power, due to their inability to raise prices without losing a large share of customers.

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Tables

Table 1: Summary Statistics

Panel A: Cross section variables

	N	Mean	SD	p10	p25	p50	p75	p90
1-day stock return (perc.)	1,979,624	0.04	4.89	-3.71	-1.45	0.00	1.35	3.70
5-day stock return (perc.)	1,979,487	0.34	9.91	-8.33	-3.42	0.07	3.59	8.79
Markup	1,979,738	1.77	1.81	0.92	1.06	1.30	1.82	2.89
Size: ln(assets)	1,979,637	5.66	2.35	2.64	3.94	5.60	7.27	8.75
Book-to-market ratio	1,953,731	0.66	3.18	0.13	0.28	0.53	0.88	1.37
Leverage	1,971,299	0.22	0.25	0.00	0.04	0.17	0.35	0.51
Asset tangibility	1,963,400	0.24	0.24	0.01	0.05	0.16	0.37	0.65
Stock market beta	1,968,316	0.99	7.95	0.08	0.50	0.95	1.44	2.06
HML risk factor beta	1,962,378	0.83	4.30	-0.43	0.11	0.67	1.41	2.38
SMB risk factor beta	1,955,720	0.18	5.75	-1.46	-0.48	0.24	0.89	1.67

Panel B: Time series variables (percentages)

	N	Mean	SD	p10	p25	p50	p75	p90
Inflation surprises	529	-0.00	0.14	-0.20	-0.10	0.00	0.10	0.20
1-day return (CRSP equal-weighted portfolio)	529	0.06	1.12	-1.06	-0.43	0.11	0.57	1.15
1-year equity risk premium (lower bound)	432	4.03	2.06	2.17	2.67	3.57	4.86	6.17
2-year nominal Treasury yield	529	4.91	3.74	0.39	1.51	4.73	7.48	10.08
10-year nominal Treasury yield	529	5.99	3.24	2.02	3.10	5.58	8.25	10.73
2-year real Treasury yield	279	0.32	1.68	-1.53	-0.84	0.05	1.26	3.03
10-year real Treasury yield	279	1.36	1.39	-0.56	0.36	1.17	2.30	3.46
2-year Treasury breakeven inflation	279	1.77	0.98	0.90	1.41	1.78	2.32	2.75
10-year Treasury breakeven inflation	279	2.12	0.42	1.57	1.85	2.20	2.44	2.61

This table presents summary statistics of the variables used in the empirical analysis. Panel A shows panel variables that are available in the cross section of firms and Panel B shows time series variables. The full sample is 1977-2022 with 12 observations per calendar year that correspond to the monthly Consumer Price Index (CPI) releases as published by the Bureau of Labor Statistics. Inflation surprises are measured as the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. For full information on data sources and variable construction refer to section 2.

Table 2: Ten-year Forward Yields, Monetary News, and Inflation News

Panel A: FOMC and CPI release days

	FOMC			CPI releases		
	nominal	real	inflation	nominal	real	inflation
2-year treasury	0.49***	0.50***	-0.01	0.56***	0.17**	0.40***
	(0.15)	(0.12)	(0.09)	(0.10)	(0.08)	(0.09)
R-squared	0.068	0.104	0.000	0.131	0.019	0.090
N	146	146	146	218	218	218

Panel B: All other days

	All other days			Monetary news days			Growth news days		
	nominal	real	inflation	nominal	real	inflation	nominal	real	inflation
2-year treasury	0.58***	0.45***	0.14***	0.46***	0.46***	0.01	0.63***	0.44***	0.19***
	(0.02)	(0.02)	(0.02)	(0.04)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
R-squared	0.159	0.118	0.018	0.085	0.099	0.000	0.202	0.129	0.041
N	4,226	4,226	4,226	1,662	1,662	1,662	2,564	2,564	2,564

This table shows results from Equation 10:

$$\Delta_1 f_t^{10,r} = \alpha_r + \beta_r \Delta_1 y_t^2 + \epsilon_t^r$$

where $f_t^{10,r}$ is the 10-year $r = \{\text{nominal,real,breakeven inflation}\}$ instantaneous forward rate, y_t^2 is 2-year nominal Treasury yield, and $\Delta_1 x$ is the 2-day change in variable x. The regressions are estimated over the sample 2004-2022 and robust standard errors are in parentheses. Panel A shows estimation results on FOMC days and CPI release days separately. Panel B shows results on all other non-FOMC and non-CPI release days, before splitting all days into 'monetary news' days and 'growth news' days, where days are assigned conditional on the correlation between stock returns and nominal yields.

Table 3: Dividend Futures, Expected Dividends, and Inflation News

Panel A: Dividend Futures

	1-day log change				5-day log change			
	1-yr nom	2-yr nom	1-yr real	2-yr real	1-yr nom	2-yr nom	1-yr real	2-yr real
Inflationary News	-0.09	-0.17	-1.62***	-1.85***	-0.70	-1.72	-2.09*	-3.10
	(0.14)	(0.32)	(0.15)	(0.31)	(1.17)	(2.44)	(1.11)	(2.35)
R-squared	0.003	0.004	0.511	0.312	0.002	0.002	0.016	0.008
N	77	77	77	75	76	76	75	74

Panel B: Lower Bound of Expected Dividend

	1-day log change				5-day log change			
	1-yr nom	2-yr nom	1-yr real	2-yr real	1-yr nom	2-yr nom	1-yr real	2-yr real
Inflationary News	0.15	0.06	-1.38***	-1.62***	0.16	-0.83	-1.25*	-2.21
	(0.17)	(0.21)	(0.20)	(0.25)	(0.76)	(1.94)	(0.73)	(1.86)
R-squared	0.010	0.001	0.440	0.354	0.000	0.001	0.014	0.007
N	77	77	77	75	76	76	75	74

This table shows estimation coefficients from the regression:

$$\Delta_k ln\left(x_t^n\right) = \alpha_k + \beta_k \text{Inflationary News}_t + \epsilon_t^k$$

where the dependent variable x_t^n is the $n = \{1, 2\}$-year dividend futures price (Panel A) or lower bound of the expected dividend (Panel B). The expected dividend is the dividend futures prices adjusted for risk premium (as measured by the Martin (2017) lower bound of the equity risk premium). Panel A and Panel B both present log changes in nominal and in real terms. The real versions adjusts nominal changes for changes in expected inflation (measured by inflation swap rates) and the surprise component of realized inflation over the change period Δ_k. The regressions are estimated over the sample 2016-2022 and robust standard errors are in parentheses.

Table 4: Inflationary News, Market Power, and Stock Returns

	Dependent Variable: $Returns^5_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Inflationary News	-1.446					
	(1.006)					
Markup	0.00479	0.00805	-0.00564	-0.00564	-0.00564	-0.00564
	(0.0159)	(0.0158)	(0.0103)	(0.0103)	(0.0103)	(0.0103)
Inflationary News × Markup	0.286**	0.294**	0.185**	0.185**	0.185**	0.185**
	(0.121)	(0.125)	(0.0889)	(0.0889)	(0.0889)	(0.0889)
R-squared	0.015	0.130	0.158	0.158	0.158	0.158
N	1,947,431	1,947,429	1,943,129	1,943,129	1,943,129	1,943,129
Firm FE	✓	✓	✓	✓	✓	✓
Time FE		✓	-	-	-	-
Industry-Time FE			✓	✓	✓	✓
Int. Firm Controls				✓		✓
Int. Factor Controls					✓	✓

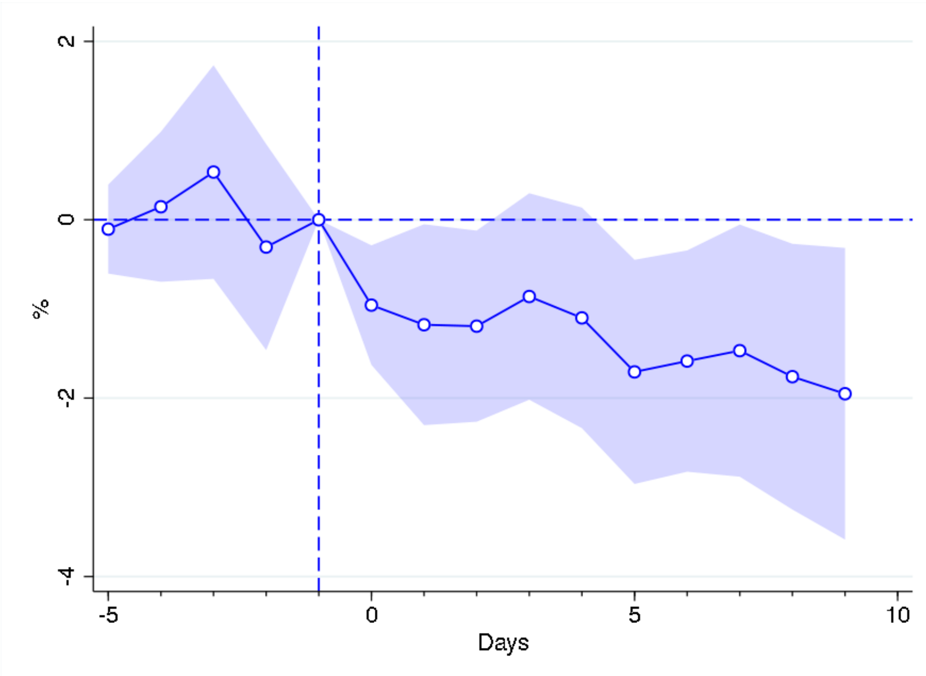
This table shows results from Equation 9:

$$Return^5_{i,t} = \alpha + \beta_1 \text{Inflationary News}_t * Markup_{i,y(t)-1} + \alpha_i + \alpha_t + \mathbf{X}'\gamma + \epsilon_{i,t}$$

where $Return^5_{i,t}$ is the cumulative stock returns calculated from day t-1, before CPI release, to day t+5, after the CPI release. Inflationary News_t is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. $\text{Markup}_{i,y(t)-1}$ is the estimated markup from De Loecker et al. (2020) and standardized to have mean zero and a standard deviation of one. α_i is a firm fixed effect. α_t is a date fixed effect. $\mathbf{X}$ are controls. *Int. Firm Controls* includes firm characteristics controls: log assets, tangibility, leverage, and market-to- book value, interacted with Inflationary News. *Int. Factor Controls* includes firm-level rolling-betas to the Fama and French (1993) asset pricing factors: market beta, size, and value, each interacted with Inflationary News. Standard errors (in parentheses) are double clustered at the firm and date level.

Figures

Figure 1: Stock Returns around Inflation Surprises

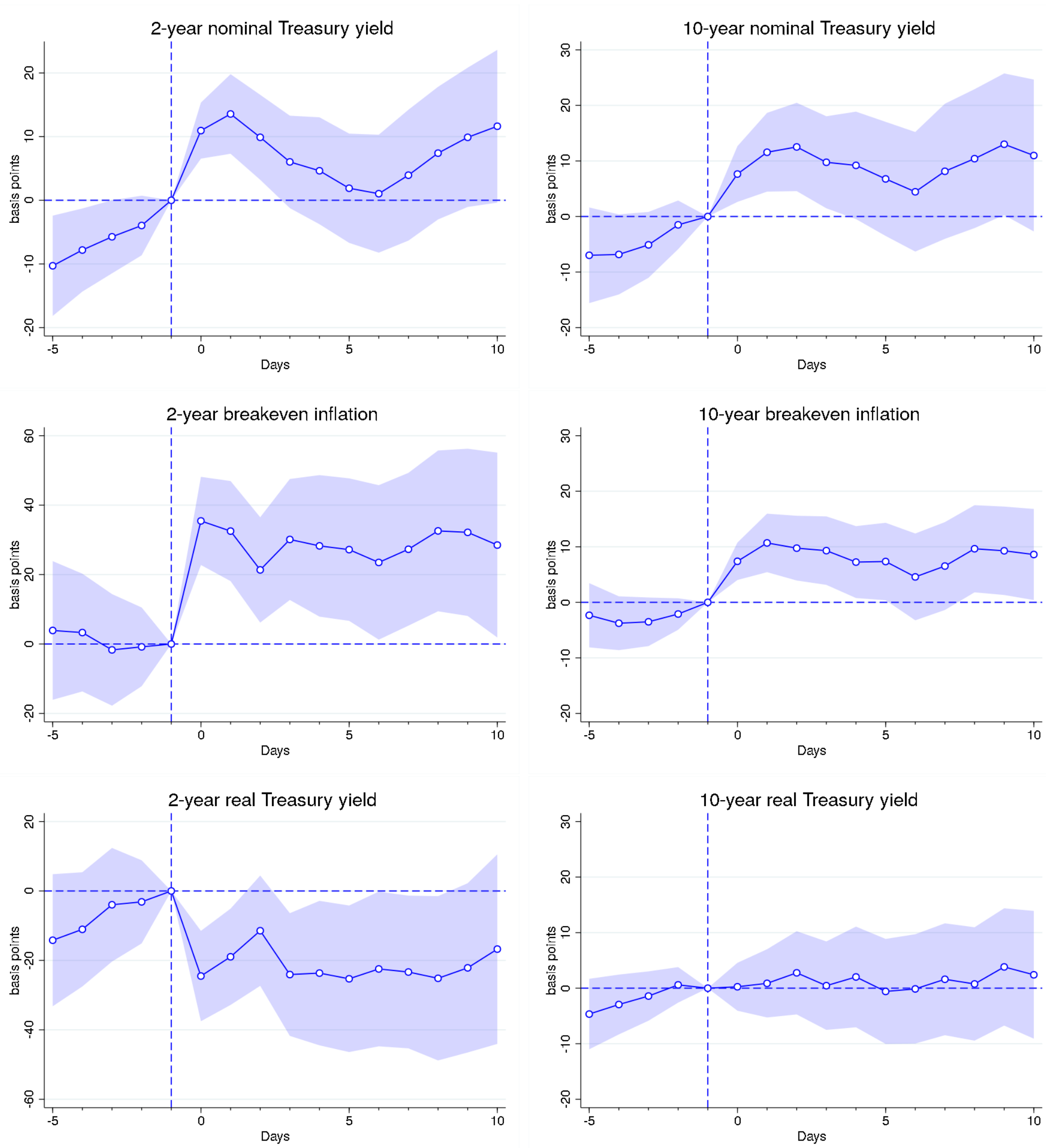


This figure plots the estimated coefficient of Equation 5:

$$Return_{i,t}^{k} = \alpha + \beta_1 \text{Inflationary News}_t + \epsilon_{i,t}$$

where $Return_{i,t}^{k}$ is the cumulative return between the day before the CPI announcement on date t and k days after for stock i. Inflationary News_t is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. Standard errors are clustered at the date level. The shaded area reflects the 90% confidence interval.

Figure 2: The Yield Curve and Inflation Surprises

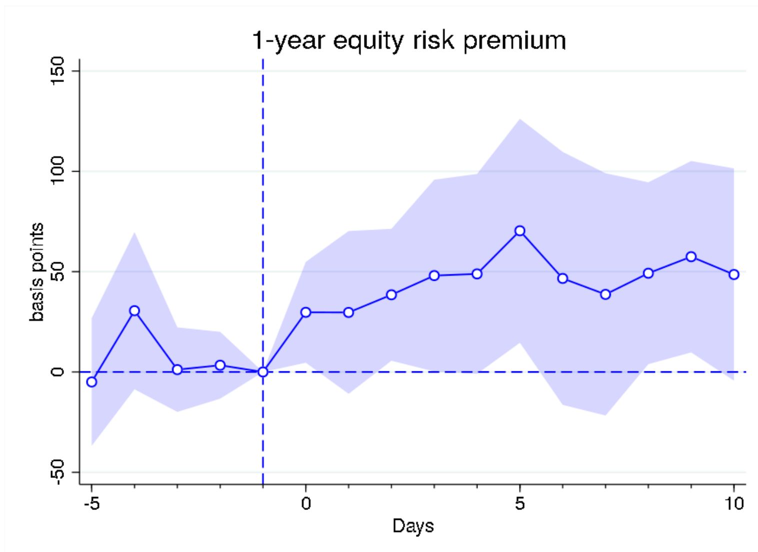


This figure plots the estimated coefficient of Equation 6:

$$\Delta_k y_t^{(n)} = \alpha^k + \beta^k \text{Inflationary News}_t + \epsilon_t^k$$

where $\Delta_k y_t^{(n)} = y_{t+k}^{(n)} - y_{t-1}^{(n)}$ is the change in n-year y ={nominal, real, breakeven inflation} from the day before the CPI announcement on date t to k days after after the announcement. Inflationary News_t is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. The left column shows changes in the 2-year nominal Treasury yield, the 2-year breakeven inflation rate, and the 2-year real Treasury yield through rows 1 to 3 respectively. The right column shows changes in the 10-year nominal Treasury yield, the 10-year breakeven inflation rate, and the 10-year real Treasury yield through rows 1 to 3 respectively. Data for the real yield curve is taken from Gürkaynak et al. (2010b). All figures are based on the sample period 1999-2022. The shaded area reflects the 90% confidence interval.

Figure 3: Equity Risk Premium and Inflation Surprises

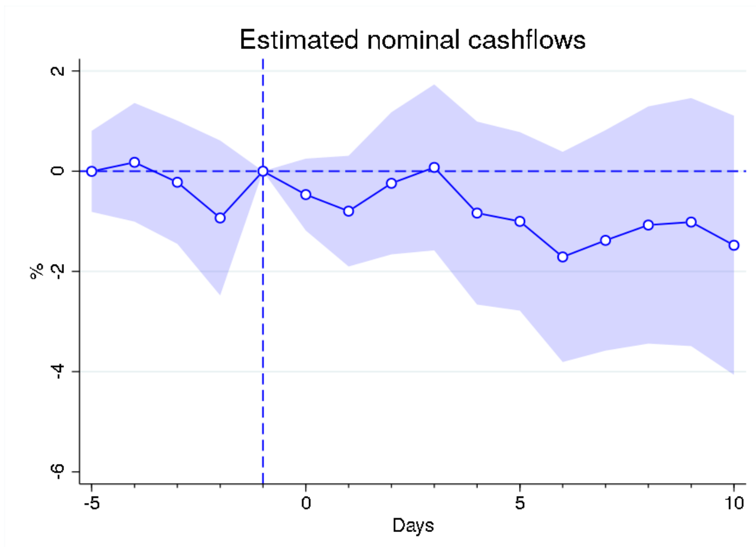


The figure plots the estimated coefficient of Equation 6 from $k = -5$ through to $k = 10$:

$$\Delta_k ERP_t = \alpha^k + \beta^k \text{Inflationary News}_t + \epsilon_t^k$$

where $\Delta_k ERP_t = erp_{t+k} - erp_{t-1}$ is the change in the Martin (2017) lower bound of the 1-year equity risk premium from the day before the CPI announcement on date t to k days after after the announcement, and Inflationary News_t is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. The estimation period is 1999-2022 and shaded area reflects the 90% confidence interval.

Figure 4: Nominal Cashflow Component of Stock Returns and Inflation Surprises



The figure plots the coefficient of Equation 8 from $k = -5$ through to $k = 10$:

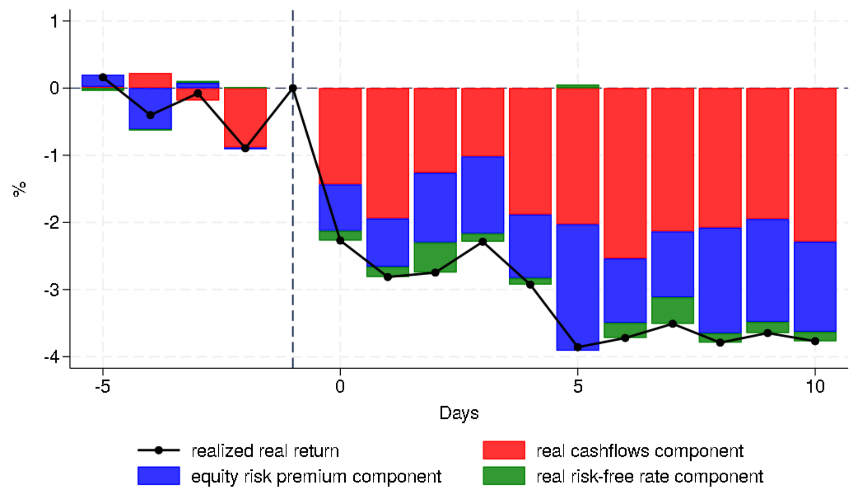
$$\widehat{Return}_{i,t}^{k,CF} = \alpha_i^k + \beta_1^k \text{Inflationary News}_t + \epsilon_{i,t}^{k,CF}$$

where Inflationary News_t is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement, and $\widehat{Return}_{i,t}^{k,CF}$ is the predicted cashflow component of the cumulative return between the day before the CPI announcement on date t and k days after for stock i as estimated from Equation 7

$$Return_{i,t}^k = \alpha_i^k + \Delta_k \mathbf{RF}_t' \Theta^k + \beta_{ERP}^k \Delta_k ERP_t + \epsilon_{i,t}^k$$

where $\mathbf{RF}_t$ is a vector of *nominal* interest rates, ERP_t is the equity risk premium, and we define the predicted cashflow component as the residual $\widehat{Return}_{i,t}^{k,CF} = \epsilon_{i,t}^k$ from the regression estimation. The estimation period is 1999-2022 and shaded area reflects the 90% confidence interval.

Figure 5: Decomposition of Real Stock Returns around Inflation Surprises



The figure stacks the coefficients of Equation 8 across c for each of $k = -5$ through to $k = 10$:

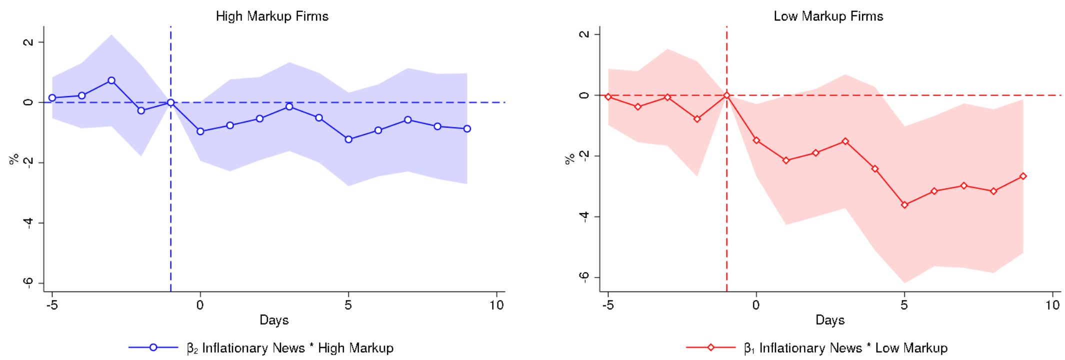
$$\widehat{Return}_{i,t}^{k,c} = \alpha_i^k + \beta_1^k \text{Inflationary News}_t + \epsilon_{i,t}^{k,c}$$

where $\widehat{Return}_{i,t}^{k,c}$ is the predicted $c = \{\widetilde{CF}, ERP, \widetilde{RF}\}$ component of the cumulative real return between the day before the CPI announcement on date t and k days after for stock i. The return components are the returns generated from changes in real cashflow expectations, $\widetilde{CF}$, changes in equity risk premium, ERP, and changes in real risk-free rates, $\widetilde{RF}$, and are estimated from Equation 11 from $k = -5$ through to $k = 10$:

$$\widetilde{Return}_{i,t}^{k} = \alpha_i^k + \Delta_k \widetilde{\mathbf{RF}}_t' \Theta^k + \beta_{ERP}^k \Delta_k ERP_t + \tilde{\epsilon}_{i,t}^k$$

where $\widetilde{Return}_{i,t}^{k}$ is the real realized return, $\widetilde{\mathbf{RF}}_t$ is a vector of *real* risk-free rates, ERP_t is the equity risk premium, and we define the predicted cashflow component as the residual $\widehat{Return}_{i,t}^{k,\widetilde{CF}} = \tilde{\epsilon}_{i,t}^k$ from the regression estimation. The black line in the figure plots the coefficients of real realised return regressed on inflation news for $k = -5$ through to $k = 10$, which is by definition the sum of the stacked coefficients on the return components. Inflationary News$_t$ is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. The estimation period is 1999-2022.

Figure 6: Stock Returns around Inflationary News by Market Power

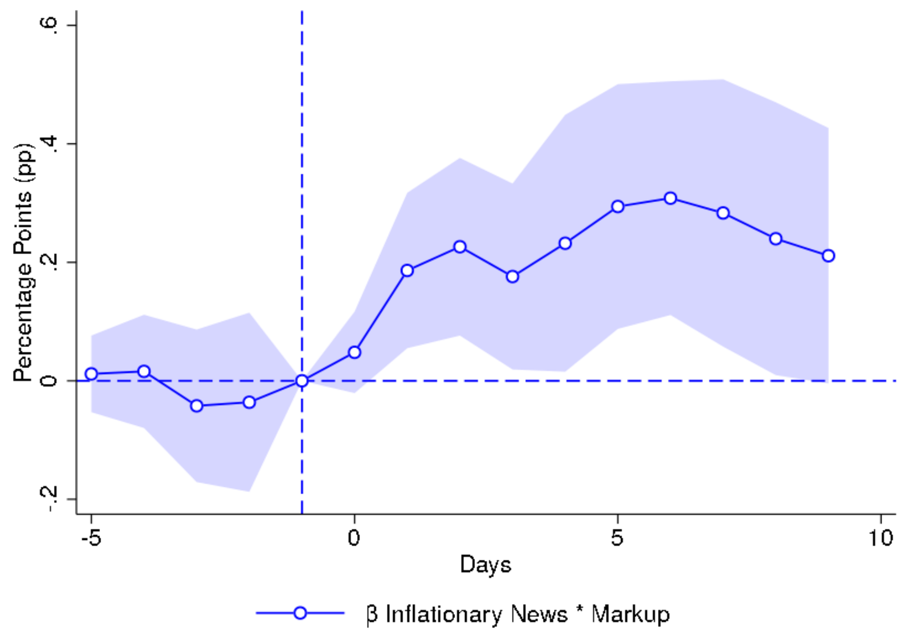


This figure plots the estimated coefficient of Equation 12:

$$
\begin{aligned}
Return_{i,t}^{k} =& \alpha + \beta_1 \text{Inflationary News}_t * \text{Low Markup}_{i,y(t)-1} \\
& + \beta_2 \text{Inflationary News}_t * \text{High Markup}_{i,y(t)-1} + \beta_3 \text{Low Markup}_{i,y(t)-1} + \epsilon_{i,t}
\end{aligned}
$$

where $Return_{i,t}^{k}$ is the cumulative return between the day before the CPI announcement on date t and k days after for stock i. Inflationary News_t is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. High $\text{Markup}_{i,y(t)-1}$ is a dummy that is equal to one if the firm has a markup above the 75th% percentile of the distribution and zero otherwise. Low $\text{Markup}_{i,y(t)-1}$ is a dummy that is equal to one if the firm has a markup below the 25th% percentile of the distribution and zero otherwise. Markup is defined as the estimated markup from De Loecker et al. (2020). Standard errors are double clustered at the firm and date level. The shaded area reflects the 90% confidence interval.

Figure 7: The Role of Market Power for Stock Returns around Inflationary News

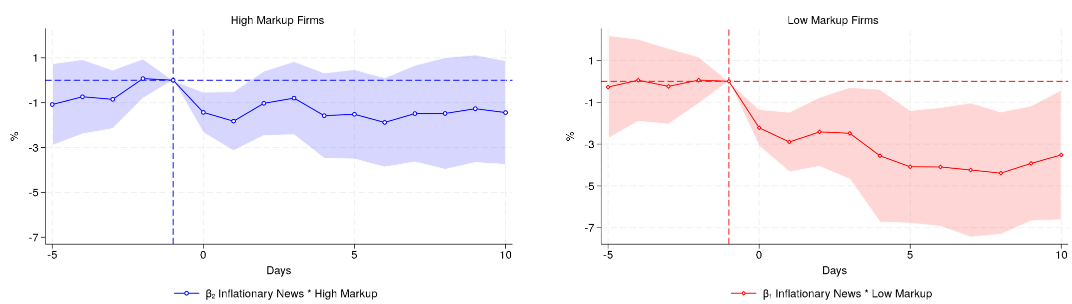


This figure plots the estimated coefficient of Equation 9:

$$Return^k_{i,t} = \alpha + \beta_1 \text{Inflationary News}_t * Markup_{i,y(t)-1} + \alpha_i + \alpha_t + \mathbf{X}'\gamma + \epsilon_{i,t}$$

where $Return^k_{i,t}$ is the cumulative return between the day before the CPI announcement on date t and k days after for stock i. Inflationary News_t is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. $\text{Markup}_{i,y(t)-1}$ is the estimated markup from De Loecker et al. (2020) and standardized to have mean zero and a standard deviation of one. α_i is a firm fixed effect. α_t is a date fixed effect. $\mathbf{X}$ are controls. Low $\text{Markup}_{i,y(t)-1}$ is a dummy that is equal to one if the firm has a markup below the 25th% percentile of the distribution and zero otherwise. Standard errors are double clustered at the firm and date level. The shaded area reflects the 90% confidence interval.

Figure 8: Real Estimated Cash Flows around Inflationary News by Market Power



This figure plots the estimated coefficient of Equation 14:

$$
\begin{aligned}
\widehat{Return}_{i,t}^{k,\widetilde{CF}} =& \alpha + \beta_1 \text{Inflationary News}_t * \text{Low Markup}_{i,y(t)-1} \\
&+ \beta_2 \text{Inflationary News}_t * \text{High Markup}_{i,y(t)-1} + \beta_3 \text{Low Markup}_{i,y(t)-1} + \epsilon_{i,t}
\end{aligned}
$$

where $\widehat{Return}_{i,t}^{k,\widetilde{CF}}$ is the estimated real cash flow component of stock returns between the day before the CPI announcement on date t and k days after for stock i. Inflationary News$_t$ is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. High Markup$_{i,y(t)-1}$ is a dummy that is equal to one if the firm has a markup above the 75th% percentile of the distribution and zero otherwise. Low Markup$_{i,y(t)-1}$ is a dummy that is equal to one if the firm has a markup below the 25th% percentile of the distribution and zero otherwise. Markup is defined as the estimated markup from De Loecker et al. (2020). Standard errors are double clustered at the firm and date level. The shaded area reflects the 90% confidence interval.

A Appendix Tables

Table A.1: The Yield Curve and Inflation Surprises (evidence from swap rates)

	2-year maturity			10-year maturity		
	nominal	inflation	real	nominal	inflation	real
Inflationary News	0.13***	0.27***	-0.14**	0.10**	0.09***	0.01
	(0.04)	(0.05)	(0.07)	(0.04)	(0.03)	(0.05)
R-squared	0.071	0.176	0.040	0.039	0.074	0.000
N	220	220	220	220	220	220

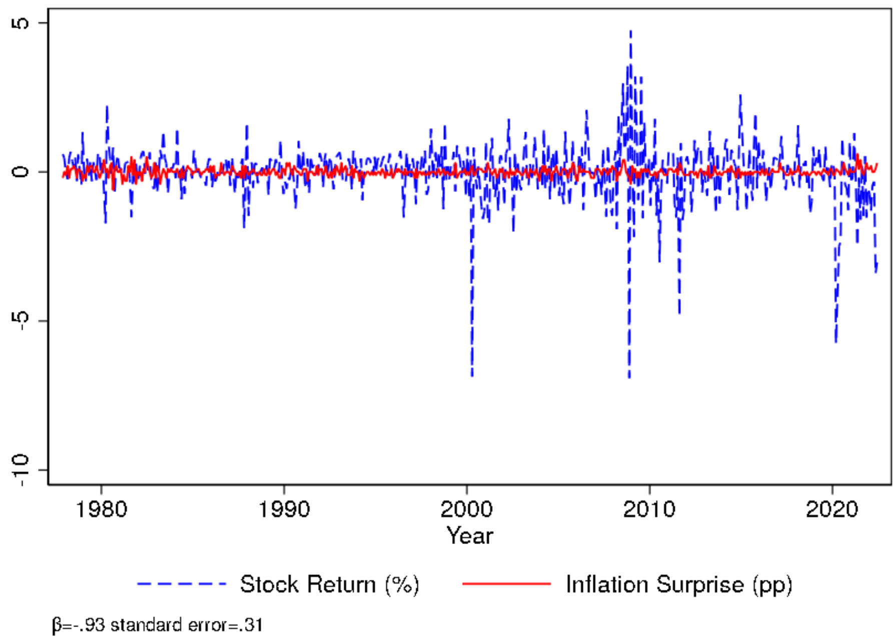
This table shows coefficient estimates from regression Equation 6:

$$\Delta_0 y_t = \alpha_k + \beta_k \text{Inflationary News}_t + \epsilon_t^k$$

where $\Delta_0 y_t^{(n)} = y_t^{(n)} - y_{t-1}^{(n)}$ is the one-day change in the n-year yield from the day before the CPI announcement on date t. Inflationary News$_t$ is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement. The table shows results for 2-year and 10-year yields on interest rate swaps (nominal), inflation swap rates (inflation), and the swap-implied real yield (the interest rate swap yield minus the inflation swap yield). Swap data is taken from Bloomberg and the sample period is 2004-2022. Robust standard errors are in parenthesis.

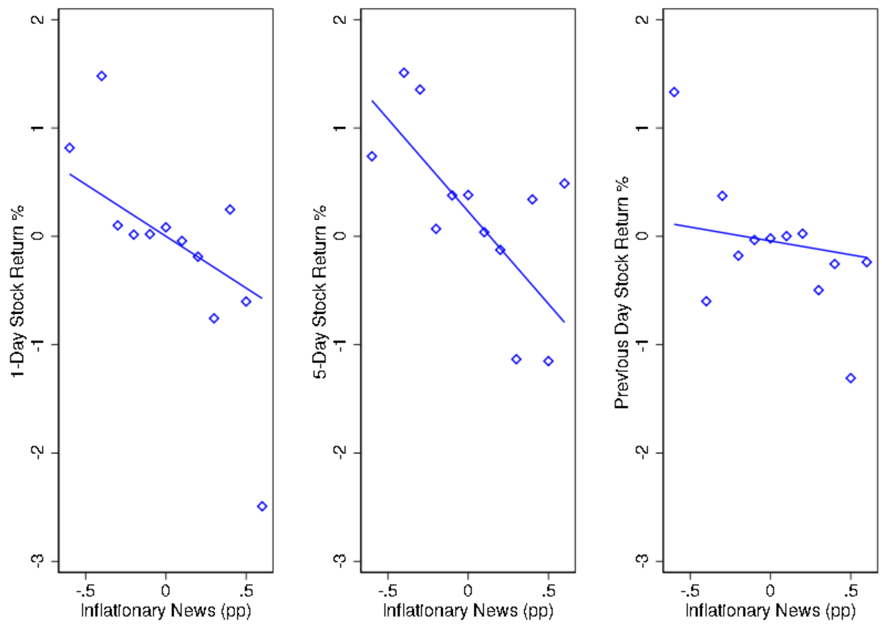
B Appendix Figures

Figure B.1: Inflationary News and Stock Returns



This figure plots the inflationary news as defined section 2 in solid red and the stock return at the day of the CPI announcement in dashed blue. β reports the coefficient of the univariate regression of the stock returns on the inflation surprise and *standard error* reports the standard error of the coefficient.

Figure B.2: Inflationary news coefficient for different return horizons



This figure combines binscatterplot between $Return^{0}_{i,t}$ (left panel), $Return^{5}_{i,t}$ (middle panel), and $Return^{-1}_{i,t}$ (right panel) on the y-axis and the Inflationary News_t on the x-axis. $Return^{k}_{i,t}$ is the cumulative return between the day before the CPI announcement on date t and k days after for stock i. Inflationary News_t is the difference between the published month-on-month CPI inflation and the median forecast expectations ahead of the announcement.