Monetary Policy and Investment Plans

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Abstract

How does monetary policy interact with corporate investment decisions? We hand-collect a firm-level panel of U.S. investment plans and link it to managers' cash-flow expectations to uncover new facts about investment decisions. Firms' investment decisions are sticky: plans are highly persistent, and the initial plan explains most of the variation in realized investment. However, we observe firms updating their investment plans within one quarter of a contractionary monetary policy shock, with a stronger effect on long-horizon plans, reflecting a term structure of investment responsiveness. New and expansionary investment plans respond more than existing plans to monetary policy. These results provide novel evidence of rigidity in certain aspects of corporate decision-making beyond slow information acquisition and processing that help explain the "long and variable" lags in monetary policy transmission. This underscores the central role of corporate decision-making in policy pass-through to the real economy. Regarding transmission mechanisms, we document a financing-cost channel, where policy-driven increases in borrowing costs reduce planned investment, and a cash-flow-expectations channel, concentrated among smaller firms.

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How does monetary policy interact with corporate investment decisions? Decades of work find that business investment responds modestly and with long and variable lags to policy shocks (Friedman [1968]). These lags have been attributed to time to build (Kydland and Prescott [1982]) or slow information acquisition (Lucas [1973], Mankiw and Reis [2002], Coibion et al. [2018]). Moreover, why company investment decisions respond at all to monetary policy is not well understood: it could be via borrowing costs (Bernanke and Gertler [1995]) or via aggregate demand. Without directly observing the corporate decision making process, the business investment response to monetary policy remains a black box.

We argue that studying the planning stage of investment is crucial to understanding the transmission of monetary policy via firms. To this end, we construct a novel dataset of quarterly forward-looking firm-level investment plans and managerial cash flow expectations for the largest U.S. non-financial corporations to directly observe how firms update their investment decisions in response to monetary policy shocks. The data provides a unique perspective into the decision-making of corporate managers in real time. We first document three new facts about investment plans: (i) plans are predictive of actual investment; (ii) once set, investment plans are rigid; and (iii) the initial plan for a given future year explains the majority of variation in realized capital expenditures.

Building on these new facts, we study how monetary policy interacts with firms' *planning* of investment. We show that firms update plans within a quarter of a monetary shock, implying that informational rigidities alone do not fully explain the delayed investment response. We document a pronounced term structure of planned investment responsiveness: plans for investment three or more years ahead are more responsive than plans for the next one to two years, consistent with greater flexibility in plans at longer horizons. Plans display partial irreversibility: firms respond strongly to monetary policy when initiating new plans, but revisions to existing plans are comparatively inert — even for distant-horizon projects — implying that planning itself embeds commitment that can dampen monetary policy transmission. Across plan types, contractionary shocks disproportionately curtail more disruptive projects — expansions, new projects, and R&D.

Finally, we investigate the mechanisms through which monetary policy impacts firm investment decisions, focusing on two main channels that we can empirically test: a cost of capital channel and a cash flow expectations channel. Firms adjust their investment plans in response to changes in their cost of debt, in particular those firms with more tangible assets. Moreover, firms adjust their cash flow expectations in the quarter following a monetary policy shock, with smaller firms adjusting more.

Overall, we interpret these results as novel evidence of rigidity in certain aspects of corporate decision

making (including about near-term, already planned, and ongoing projects) that dampens and delays the transmission of monetary policy to real activity. Importantly, this channel is distinct from slow updating of expectations (Lucas [1973], Mankiw and Reis [2002]), as we find that companies do incorporate monetary policy changes into their investment plans and cash flow expectations within the quarter. Thus, understanding corporate decision making is crucial for assessing the efficacy of transmission of policy to the real economy. While the focus of our paper is on monetary policy, our results provide important insights into firm responses to shocks and policies in general.

One key contribution of our paper is our data collection effort, which aggregates hand-collected publicly available information from various company disclosures, including regulatory filings, earnings call presentations, and investor presentations, to create a novel panel dataset of firm investment plans for multiple plan horizons up to five years in the future. First, we hand-collect 46,871 firm-quarter-projection year observations covering 881 of the largest non-financial U.S. corporations. We merge this with company guidance data on investment and cash flows from IBES and Refinitiv LSEG, yielding over 124,000 observations of management capital expenditure plans for nearly four thousand U.S. firms. Our data on investment plans spans 2000-2024 and accounts for nearly 80% of the total capital expenditure and roughly 60% of total assets of all U.S. non-financial corporations reported in Compustat since the 2008 crisis. The vast majority of firms update plans on a quarterly basis, providing a high-frequency view into decision making. To compare the effects of monetary policy on different types of investment, 20% of our investment plans data include qualitative comments about the kind of investment, such as research and development, environmental projects, and maintenance, allowing us to measure how plans for these different kinds of investment respond to shocks.

We first document new facts about investment plans themselves. Investment plans strongly predict actual investment with a predictability coefficient of around 0.8, confirming that the plans are informative about a firms' intentions. We find that investment plans are rigid once set, with a quarter-to-quarter autocorrelation for the same future projection year within a firm of over 80%. Plans are relatively less rigid during economic downturns and recessions, and long-term plans are more rigid once set than short-term plans. We also find that the initial capital expenditure plan made for a given future year explains about half of the variation in final capital expenditures in that year within firm. Combined, these results suggest that firms face frictions that make certain investment plans inflexible once set. In turn, the presence of these inflexible investment plans may dampen the transmission of monetary policy to realized investment.

To investigate this further, we employ standard monetary policy shocks constructed using high-frequency

changes in interest rate futures around FOMC announcements. As our baseline measure of monetary policy shocks, we employ the Bauer and Swanson [2023] shocks that residualize macro variables and are thus closer to a pure policy "surprise." To capture changes to the longer end of the yield curve, we also use the high frequency changes in 2- and 10-year US Treasury bond futures around FOMC announcements. To investigate the cost of debt channel of monetary policy, we use changes around the 2-day monetary policy event window in firm-level cost of debt (similar to Hanson and Stein [2015]). These provide market changes that we can reasonably attribute to monetary policy surprises. The identifying assumption, as is common in the high frequency identification literature, is that within the 2-day event window of a Fed announcement, there is little other news about the economy that could be driving these market securities.

As our main outcome variable of interest, we subtract planned real capital expenditure from the prior period capital expenditure, adjusting for time-varying and horizon-specific inflation expectations from the Cleveland Federal Reserve Bank. We normalize by prior year assets and regress this measure on the sum of all monetary policy shocks that occur in the fiscal quarter prior to the announcement. We control for prior quarter cash to assets, leverage, log assets, return on assets, tangibility, and Tobin's Q; we also control for prior quarter changes and levels of the CFNAI index, and 2-year UST yields and term spread, as well as four lags of GDP growth, unemployment rate, and inflation rate.

First, we show that firms update their plans in response to monetary policy shocks, and do so within a quarter of the shock taking place. Next, we find evidence of a term structure of planned investment responsiveness: plans about investment expected to take place three or more years into the future are more responsive than plans about investment expected to occur in the next year or two. Moreover, there is some evidence that there is duration matching along the term structure: long-term investment plans are more responsive to shocks to long-term yields than short-term plans are. Monetary policy is thus most effective in influencing investment that is planned to occur further into the future, and those projects for which implementation has not yet begun, due to the relatively greater sensitivity of investment plans concerning longer horizons. We also find significant variation in responsiveness across plan types: we show that firms reduce more plans that are potentially more disruptive, such as plans for expansion, new projects, and research and development, in response to contractionary monetary policy shocks.

Next, we show evidence of partial irreversibility of plans, which poses a friction for monetary policy transmission to investment. We show that firms are more responsive to contractionary monetary policy when initiating a new investment plan; revisions of existing plans are less responsive. This is the case even for

plans for horizons several years into the future which firms are unlikely to have begun implementing. These results suggest that the irreversibility of investment projects may begin even before implementation begins, due to the irreversibility of plans themselves, in contrast to the existing notions of investment irreversibility that arise from a wedge between the purchase and sale of specialized capital goods (Arrow [1968], Bernanke [1983]).

We next directly test mechanisms of monetary policy transmission, and how they vary across firms. First, we explore firm-specific channels. Firms may adjust downward their investment plans in response to a contractionary monetary policy shock due to many reasons, including more expensive external financing or due to reduced cash flow expectations arising from lower sales or higher interest expense. We first investigate the cost of debt channel. We estimate the responsiveness of firms' investment plans to changes in firms' cost of debt due to monetary policy, as measured by high-frequency changes in their outstanding bond yields around monetary policy events. We find that firms reduce their planned investment in response to increases in their cost of debt. Firms with more tangible assets and higher interest expense ratio are more responsive to changes in their cost of debt induced by monetary policy. Consistent with this, we find similar heterogeneity across firms in their net issuance response to monetary policy.

Next, to investigate the cash flow expectations channel, we estimate the responsiveness of firms' expectations regarding net income to monetary policy shocks, and how changes in firms' forecasts regarding net income co-move with changes in firms' investment plans. We find that firms reduce their expectations of net income in response to contractionary monetary policy, and a strong correlation between reductions in net income expectations and reductions in investment expectations. We find that these effects are stronger for smaller firms.

Finally, we find that positive shocks in inflation expectations around monetary policy events significantly reduce investment, and this effect is more pronounced for smaller firms and those with greater share of tangible assets. These results suggest that some part of the channel through which investment projects are affected by monetary policy is via shocks to inflation expectations, consistent with experimental survey results from Coibion et al. [2018].

Our results help explain the well-documented pattern that realized business investment lags monetary policy shocks (Bernanke and Gertler [1995], Christiano et al. [2005], Jeenas [2018]). Corporate investment plans offer a high-frequency perspective on how companies adjust to a wide range of shocks beyond just monetary policy, improving significantly upon what is feasible using ex-post realizations data alone. While

this paper focuses on the transmission of monetary shocks, the same plan-revision framework can be applied to study firms' responses to tax changes, regulatory shifts, demand or supply shocks, and other corporate finance decisions. Thus, data on investment plans open up a host of new opportunities for understanding corporate behavior in dynamic macroeconomic environments.[1]

We build on a large literature of how monetary policy affects firms by introducing new data on investment plans, going back to Keynes [1937], Friedman [1968], Cochrane [1998], Bernanke et al. [1999]. Gertler and Karadi [2015] use high-frequency identification and a VAR on data from 1979-2012 to show the effects of surprise monetary policy on bond rates, inflation, industrial production, and the excess bond premium. There is significant heterogeneity documented among firms in their responsiveness to monetary policy.[2] Gertler and Gilchrist [1994] show that small firms account for a larger share of the decline in real activity following a monetary tightening. Ottonello and Winberry [2020] find that in the data, firms with low default risk are more responsive to monetary policy shocks, while Cloyne et al. [2023] find that younger firms paying no dividends exhibit the largest changes in investment. While much of the empirical literature focuses on the short-term effects of monetary policy, recent papers have focused more so on the longer-term real effects of monetary policy, for example via innovation (see Ma [2023] for a recent survey and discussion) or hysteresis of TFP and the capital stock (Jordà et al. [2024]). The transmission mechanism of monetary policy via firms may differ in the context of a declining share of loan borrowing; Crouzet et al. [2019] finds that the pass through of monetary policy to investment has declined together with the aggregate loan share post-1990, and is weaker for firms with lower loan share. Similarly, Darmouni and Siani [2022] documents a negligible pass through of unconventional monetary stimulus to bond market participants' investment. We empirically test this further using data on planned investment.

Recent empirical advances in understanding how monetary policy affects real outcomes arise from improving the right hand side of the regression equation. Many papers sharpen and improve on measuring true monetary policy surprises, and regress various ex-post outcome variables on these plausibly exogenous shocks. Romer and Romer [2004] propose a narrative approach using data on FOMC meeting accounts, which Aruoba and Drechsel [2024] build upon. Kuttner [2001] and Bernanke and Kuttner [2005] use price changes in the fed funds futures contract in the days around a policy action to extract the change in market expectations of the Fed funds target rate. Similar high-frequency responses to nominal rates are used by

[1] We explore these questions further in our companion paper Selgrad and Siani [2025].

[2] In more recent theoretical work, Liu et al. [2022] show that market leaders respond more so to expansionary monetary policy when rates are low.

Hanson and Stein [2015], Nakamura and Steinsson [2018], Gertler and Karadi [2015], Miranda-Agrippino and Ricco [2021], Gurkaynak et al. [2005], and van Binsbergen and Grotteria [2024] (see Ramey [2016] for a survey). While some of these shocks can be attributed to information revelation (Nakamura and Steinsson [2018], Romer and Romer [2000],Cieslak and Schrimpf [2019]), recent work extracts the pure interest rate shock from the information component (Jarociński and Karadi [2020]). Recent work has also improved relevance of the MPS (Swanson and Jayawickrema [2023]) and reduced the predictability of the shocks (Bauer and Swanson [2023]). We build on this literature by focusing on sharpening the *left hand side* of the classic monetary policy effects regression. Specifically, we use investment plans (and changes in investment plans) as the outcome variable of interest, which reflects firms' current plans for future investment based on all information available at that point in time. By doing so, we are able to remove much of the noise associated with implementation lags, and map changes in planned investment to contemporaneous changes in market costs of debt and cash flow expectations.

Our work builds on a large literature on investment determinants (Jorgenson and Stephenson [1967], Tobin [1969], Keynes [1937], Fisher [1930], Kuh [1963], Greenwood and Hanson [2015] Lamont [2000], Fazzari et al. [1988], Barro [1990], Gennaioli et al. [2016b]), by analyzing how investment responds to changes in the cost of capital versus cash flow expectations. Modern macro models predict a nearly infinite investment response to interest rates. Empirical results thus far are mixed. For example, Gilchrist and Zakrajšek [2012] show that higher credit spreads predict lower growth; meanwhile Kothari et al. [2014] show that while a decline in credit spreads predicts higher aggregate investment growth, the effects are weak and short-lived. Recent empirical work has addressed the problem of simultaneity by using monetary policy shocks to show that in aggregate, investment is affected by changes in interest rates (see for example Gertler and Karadi [2015]). However, micro data on firms suggest that managers are relatively insensitive to changes in their cost of capital when it comes to determining hurdle rates and thus investment (Graham [2022], Gormsen and Huber [2022]). A complementary paper, Selgrad and Siani [2025], uses similar data to show how corporate investment responds to uncertainty and changes in cash flow expectations outside of a monetary policy context (in a similar vein as Fazzari et al. [1988], Kaplan and Zingales [1997]). Our data allows us to trace with more detail the effects of monetary policy, adding to a recent literature that uses micro data to better understand the transmission channels (Selgrad [2023]). This line of work is particularly important as the largest firms rely less so on banks and more so on capital markets.

Our work contributes to a rapidly growing set of papers on firm expectations and forecasting and their

real effects. Manski [2004] makes the case for studying expectations of economic agents to better analyze decision-making, and many studies have since used surveys to understand firm expectations of macro and firm-level outcomes. Early papers to use firm investment expectations data include Lamont et al. [2000], which uses aggregated firm-level survey data of investment from 1948-1993 to show that planned future investment forecasts low stock returns, and Guiso and Parigi [1999], which uses survey data from the Bank of Italy in 1993 to show that uncertainty weakens the responsiveness of investment to demand. In more recent years, Coibion et al. [2018] and Coibion et al. [2020] use survey data to explore how firms respond to expectations of macroeconomic conditions and Gennaioli et al. [2016a] and Ma et al. [2020] use survey data to map manager expectations of earnings growth to planned or actual investment. Graham [2022] provides an overview of management plans from CFO surveys, including how CFOs make scenario-specific plans, indicating that revenue forecasting are most consequential for firms, and capital spending plans behaves as if it follows a multi-year plan. A closely related paper Sharpe and Suarez [2021] analyzes these CFO surveys and finds that according to CFOs, investment plans are insensitive to interest rates; we build on this using a longer panel that includes many more firms to allows us to explore heterogeneity and mechanisms. Barry et al. [2022] uses the CFO survey data on investment and hiring plans around the onset of the COVID pandemic to show that investment and financial flexibility was valuable to firms during the COVID emergency. Dessaint et al. [2023] collect data on company investment horizons to show how the quality of investor information affects investment differentially for firms with long- versus short-term projects. A related strand of literature in macroeconomics studies the forecasts and forecast errors of professional forecasters (Farmer et al. [2024]), and their responses to monetary policy (Campbell et al. [2012], Bauer and Swanson [2023], Nakamura and Steinsson [2018]), finding forecasters make revisions in response to Fed information and the Fed's response to macro news. In addition, a large and growing literature in accounting studies the strategic considerations associated with managers disclosing guidance (see Call et al. [2024] and Roychowdhury et al. [2019] for excellent surveys). We build on this growing literature by constructing and analyzing the most comprehensive micro-data on investment plans and cash flow expectations to date.

The remainder of the paper is organized as follows. We first discuss the new data on investment plans in Section 1. We present novel facts about investment plans in Section 2. Motivated by these facts, we present a conceptual framework based on existing models in the literature in Section 3. Section 4 presents findings about the effects of monetary policy on plans and Section 5 shows evidence of transmission mechanisms. Section 6 discusses implications and Section 7 concludes.

1 Data

Investment plans. Our core dataset is compiled using novel, hand-collected data on investment plans and merging this with corporate expectations data from LSEG and IBES. First, we construct a new, manually collected dataset containing 46,871 company investment plans for 881 U.S. publicly traded non-financial companies. To do this, we sort U.S. non-financial firms in Compustat by total assets, and check 58,392 files including quarterly and annual reports, earnings reports, and other investor disclosures on company websites for the largest 1,387 U.S. non-financial firms. Because firms are not required to disclose their investment plans, there is significant heterogeneity in how these data are reported. In our final sample, 80.7% of the observations come from the footnotes of SEC filings, 18.3% from earnings call presentations, and the remainder come from other investor presentations.[3]

As an example, Ford Motor Company reported in the footnotes of their 2023 Q4 10-K the following: "Capital spending was $8.2 billion in 2023, $1.6 billion higher than a year ago, and is expected to be in the range of $8 billion to $9.5 billion in 2024."[4] As another example, American Airlines wrote in its June 2024 10-Q "We estimate that, based on our commitments as of June 30, 2024, our planned aggregate expenditures for aircraft purchase commitments and certain engines on a consolidated basis for the remainder of 2024 through 2028 would be approximately $14.0 billion".[5] See Figure C.2 for further examples of how firms report their capital spending plans in earnings presentations. When the planned capital expenditure is reported as a range, as in the Ford example, we take the midpoint of the range. If the plans are spread out over many years, as in the American Airlines example, we assume the total amount is equally distributed across all years.

While artificial intelligence programs can help aggregate qualitative observations about company investment plans (Jha et al. [2024]), the heterogeneity in ways that companies report this information makes the task more suitable for manual entry. Thus, we train a team of research assistants to parse through SEC filings, earnings call reports, and investor day presentations to collect the data. Research assistants search for the terms "capital planning", "planned capital expenditures", "capital budgeting", and variations, and collect the amounts, time horizon, and any qualitative information surrounding the forecast. We describe the data

[3] Figure C.3 in Appendix C shows the sources of data over time.

[4] See the SEC filing at link `https://www.sec.gov/ix?doc=/Archives/edgar/data/0000037996/000003799624000009/f-20231231.htm`.

[5] See the SEC filing at link `https://americanairlines.gcs-web.com/static-files/ce8cb2f0-7c8f-4324-be01-b8e559b626e4`.

collection and cleaning process in Appendix B.

We supplement our manually collected company investment plans with additional investment projections obtained from IBES (company guidance) and LSEG Guidance Reports (see Mayew et al. [2024]). The dataset is at the firm, date of announcement, year of projection level, and covers between 70-80% of capital expenditures and 60% of total assets of the universe of non-financial U.S. firms in Compustat from 2008-2023 (see Figure 1 for the time series of data coverage). Table C.2 reports the summary statistics of firms that are in our sample, compared to non-financial U.S. firms in Compustat. Firms in our sample are significantly larger than the universe of Compustat firms, with a median firm of 2.4 billion in total assets versus the median Compustat firm of 300 million in assets. Table C.2 further compares the firms from each data source. Firms in our manually collected data are larger than the firms in the LSEG or IBES data, as measured by assets. Along other dimensions, the median firm looks similar across the three sources of data.

Across these three sources of investment plans, we observe forward-looking investment plans for 3,734 firms made in 1999-2025 for projected investment occurring in the years 2000-2033. Figure 2 shows the distribution of projection years across the three sources; there is fairly even coverage over the years. We observe plans for firms across a variety of industries, as shown in Figure 3. The plan horizon varies significantly by industry, as summarized in Figure 4; firms in the utilities and transportation sectors tend to have much longer projection horizons on average, from 3-5 years on average, while construction and healthcare companies have on average 15-18 months between announcement and end of investment plan horizon. Firms frequently update their projected investment for a given fiscal year. Figure 5 shows the modal number of revisions to a given investment plan is three. Further, Figure 6 shows that these revisions are most often made quarterly, providing helpful high-frequency variation to study the investment decision responses to shocks.

Because we aggregate the stated investment plans from public disclosures, we consider them the managers' carefully considered plans of future investment given available information. Managers are strongly incentivized to provide guidance honestly and avoid "cheap talk". The 1934 Securities Exchange Act, Section 10b-5 makes it unlawful for anyone to "make any untrue statement of a material fact or to omit to state a material fact... in connection with the purchase or sale of any security." (U.S. Congress [1934]). Managers are thus constantly under the threat of litigation when making public disclosures (Francis et al. [1994], Rogers et al. [2011]). Moreover, the passage of the Sarbanes-Oxley Act in 2002 following the Enron and Worldcom scandals put considerable pressure on executive officers to ensure the quality and veracity of disclosures. By

contrast, survey-based measures of managerial expectations often used in the literature, while informative, typically rely on voluntary responses with fewer direct consequences for misstatement. As a result, our data offers a uniquely accountable and transparent lens on firms' forward investment intentions.

Projected Cash Flows. We obtain firms' projections for various cash flow variables from LSEG Guidance Reports (see Mayew et al. [2024]). LSEG sources these projections from public disclosures, such as conference calls, press releases, analyst days, and industry conferences. We focus on projections for net income as these are well populated. Firms provide projections for this cash flow variable in a similar way to their projections for investment, specifying a dollar amount expected for a given projection period. For an investment plan announced in a particular fiscal quarter and for a given future projection period, we also observe projected net income in 11,305 cases. There are 1,103 unique firms that provide projected net income alongside an investment plan. LSEG Guidance Reports provides projections for cash flow variables made between 2004-2021.

Hiring. For hiring data, we use Workforce Dynamics data from Revelio. The coverage in Revelio is from January 2008 to June 2024. There are 7361 unique firms in Revelio that we are able to match to our Compustat, and 603 that we can match with our investment plans data. There are 7 unique job categories (including engineering, finance, marketing, operations, sales, scientist, and administration).

Monetary policy surprises. We use high-frequency changes in interest rate futures around FOMC announcements constructed by Bauer and Swanson [2023]. For our baseline, we use the orthogonalized shock, which is constructed using high-frequency changes in U.S. short maturity interest rate futures around Fed announcements that are orthogonalized with respect to predictable macro news (e.g., nonfarm payrolls, employment growth, and S&P returns). To cover changes to the longer-end in the yield curve, we use the change in the price of the 2-year Treasury bond future, 10-year Treasury bond future, from 10 minutes before the announcement until 20 minutes after the announcement. We further compute changes in firm-specific cost of debt using changes in amount-outstanding weighted average bond yields from TRACE in the two-day window around each MP event as defined by Bauer and Swanson [2023], in a similar spirit as Hanson and Stein [2015]. Not all firms have bonds outstanding, but we can compute these high-frequency cost of debt shocks for 1,663 firms in our sample. We aggregate these shocks over a 90-day rolling window and merge them at the fiscal quarter end prior to each investment plan announcement.

Other data. We supplement our data with macro variables including the CFNAI index for monthly economic activity from the Chicago Federal Reserve, and U.S. Treasury spot rates, GDP growth, inflation

and unemployment rates from FRED. To adjust the investment plans in real terms, we obtain data on inflation expectations from the Cleveland Federal Reserve. We combine the data with realized capital expenditures and other firm characteristics in Compsutat. We use Mergent FISD for data on corporate bond debt outstanding, employing the merge with Compustat as described in Mota and Siani [2023], and use Capital IQ to gather the share of bond debt for each firm.

2 New Facts about Firm Investment Plans

2.1 Plans are Informative about Actual Investment

First, we establish that the plans are informative about actual investment. In aggregate, planned capital expenditures closely track actual capital expenditures. In Figures 7a and 7b, we show the total planned 1-year (3-year) forward capital expenditure growth relative to the actual capital expenditure growth for the subset of firms in our sample. Realized investment tends to be lumpier than planned investment (Doms and Dunne [1998], Caballero and Engel [1999]), particularly when considering longer horizons. For example, capital expenditures were planned to rise modestly in 2020 based on 1-year plans made in 2019; but instead dropped by 20% for our subsample.

We can further show that individual firm-level plans are informative about realized investment. To test this, we regress firm i's *actual* change in investment in year $t+h$ relative to year t on its *planned* change in investment over this horizon, planned as of the end of year t, including firm fixed effects:

$$\frac{I_{i,t+h} - I_{i,t}}{I_{i,t}} = \beta_h \frac{\mathbf{F}_{i,t}[I_{i,t+h}] - I_{i,t}}{I_{i,t}} + \alpha_i^h + \varepsilon_{i,t}^h \tag{1}$$

We plot the estimated coefficients across all horizons $h \in [1,5]$ in Figure 8. We condition on plans that are announced at least three months prior to the end of the projection period; for example, we include AT&T's 2011 capital expenditure plan announced in March 2011, but not the one announced in April 2011. For all of the projection horizons, the coefficients are around 0.8 and statistically significant. This suggests that plans are significantly better than random noise, and are informative about actual investment. We report the regression results of predictiveness of one-year and longer-horizon plans in Table C.4, and find that longer horizon plans (greater than two years) are generally slightly less predictive.[6]

[6]Forecast errors are roughly mean zero and do not demonstrate a clear bias; see Figure C.4 for the distribution.

2.2 Plans are Sticky

We next investigate how sticky firms' investment plans are by running auto-correlations of the investment plans normalized by lagged assets. We estimate the following specification, for $\ell = 1, 2, 3$:

$$\frac{F_t[I_{i,t+h}]}{A_{i,t-1}} = \beta \frac{F_{t-\ell}[I_{i,t+h}]}{A_{i,t-\ell-1}} + \alpha_i + \epsilon_{i,t,h} \tag{2}$$

The results are shown in Table 2. We find evidence that investment plans tend to be quite sticky, with a firms' plans in a given quarter for some future period being strongly correlated with the firms' plans in the previous quarter for the same future period. This stickiness reduces slightly as we compare plans for the same future period that are two or three quarters apart, but is still high, as evidenced by columns (2) and (3). We also investigate whether this stickiness differs depending on the horizon of the plan in columns (4)-(6). Long-term plans appear to be more sticky than short-term plans. This suggests that long-term plans may be adjusted less frequently once compared to short-term plans.

We also investigate whether this stickiness is affected by the macroeconomic environment in which firms make plans. The results are shown in Table 3. We find evidence that investment plans become more sticky during upturns, as evidenced by the positive interaction coefficient in column (2), and less sticky during recessions, as evidenced by the negative interaction coefficient in column (3). This suggests that firms may allocate more resources to processing information and adjusting decisions in bad time, consistent with lower information rigidity in downturns as documented in Coibion and Gorodnichenko [2015].

2.3 Initial Plans Explain Most of the Variation in Realized Investment

We find that the initial capital expenditure plan explains the majority of the variation in final capital expenditures. To show this, we decompose the variance of a firm's realized capital expenditures into the following components: (1) the very first plan projected for that year, (2) revisions made to the firm's capital expenditure plans at different horizons, and (3) surprises between the final plan and the realization. Suppose the initial plan for year t is made in year $t - S$. We can then write the realized capital expenditure as a function of the initial plan, subsequent revisions, and a final surprise, where we normalize all variables by prior quarter assets:

$$I_{it} = \mathrm{F}_{i,t-S}[I_{it}] + \sum_{s=1}^{S-1} \Delta_{i,t-s} + surprise_{it}, \tag{3}$$

where $\Delta_{i,t-s} = \mathrm{F}_{i,t-s}[I_{it}] - \mathrm{F}_{i,t-s-1}[I_{it}]$ are quarterly plan revisions and $surprise_{it} = (I_{it} - \mathrm{F}_{i,t-1}[I_{it}]))$ is the surprise between the final plan and the realization. Notice that we can then take the covariance of both sides with realized investment I_{it}:

$$\mathrm{var}(I_{it}) = \mathrm{cov}(\mathrm{F}_{i,t-S}[I_{it}], I_{it}) + \sum_{s=1}^{S-1} \mathrm{cov}(\Delta_{i,t-s}, I_{it}) + \mathrm{cov}(surprise_{it}, I_{it}) \tag{4}$$

Equation 4 show that the variance of realized investment can be decomposed into a covariance with (1) the baseline forecast S quarters in advance, (2) the quarterly planned revisions, and (3) the final surprise relative to the plan. Dividing both sides by the variance of realized I_{it} yields a simple variance decomposition:

$$1 = \frac{\mathrm{cov}(\mathrm{F}_{i,t-S}[I_{it}], I_{it})}{\mathrm{var}(I_{it})} + \sum_{s=1}^{S-1} \frac{\mathrm{cov}(\Delta_{i,t-s}, I_{it})}{\mathrm{var}(I_{it})} + \frac{\mathrm{cov}(surprise_{it}, I_{it})}{\mathrm{var}(I_{it})} \tag{5}$$

Each component on the right hand side maps to coefficient estimates of the following set of regressions:

$$\begin{aligned} \mathrm{F}_{i,t-S}[I_{it}], &= \alpha_{\text{base}} + \beta_{\text{base}} I_{it} + e_{it,\text{base}}, \\ \Delta_{i,t-s} &= \alpha_s + \beta_s I_{it} + e_{it,s} \ \forall s, \\ surprise_{it} &= \alpha_{\text{surprise}} + \beta_{\text{surprise}} I_{it} + e_{it,\text{surprise}}. \end{aligned} \tag{6}$$

When estimating these regressions, we normalize both sides by prior period total assets and include firm fixed effects so the interpretation is within firm. We winsorize all variables and condition on only the balanced panel of firms that have full 8 (4) quarters of projections. Panel (a) of Figure 9 reports the results for the 28 firms with 8 quarters of projections, and Panel (b) reports the results for the 525 firms with 4 quarters of projections. About 41% (67%) of the variation in realized capital expenditures within firm is explained by plans made 8 (4) quarters in advance. Quarterly plan revisions explain a relatively small share of the variation in final plans, and the final surprise explains about 0% (18%) of final variation in investment. For firms with 8 quarters of plans, the 4-quarter ahead plan revision explains a larger share of the variance (33%) in realized capital expenditures than the other quarterly revisions, suggesting that annual reports or 10-Ks hold more comprehensive information than quarterly reports or earnings calls.

Our results represent striking evidence of rigidity in investment plans. Firms appear to commit to a level of investment up to 2 years in advance, and intermediate revisions do not explain nearly as much variation as the initial plan. This is consistent with earlier studies of surveys of industrial firms on the planning process of major capital projects (Christiano and Todd [1996], Jorgenson and Stephenson [1967], Krainer [1968]), where the planning phase includes preparing architectural plans, financing, permits, and more. It also suggests that the ability for the central bank to affect investment is by construction limited by economic conditions from several quarters ago.

3 Conceptual Framework

Neoclassical models (Jorgenson and Stephenson [1967], Jorgenson [1963]) posit an immediate response of investment to changes in costs of capital. However, firms' realized investment responses to monetary policy shocks occur with significant delays, posing a challenge to the frictionless neoclassical models. So far, we have shown that firm investment plans themselves are relatively sticky, and explain a large portion of realized investment. This suggests that the nature of investment plans potentially poses a friction for the transmission of monetary policy to realized investment. We outline three prominent theoretical frameworks that rationalize delayed reactions in realized investment and align with the presence of sticky investment plans: (1) time-to-build and time-to-plan, (2) irreversibility and real-options, and (3) information stickiness. Each provides distinct empirical predictions about the heterogeneous revisions to firms' forward-looking investment plans.

The time-to-build and time-to-plan models such as Kydland and Prescott [1982] and Christiano and Todd [1996] formalize frictions associated with planning (approvals, permitting, design) and subsequent implementation or construction phases, positing lags between initiation and completion of investment projects. Under these frictions, a contractionary MP shock immediately reduces incentives for new project initiation, yet ongoing projects are minimally affected due to sunk costs and technological constraints. These models would predict that near-term investment plans are largely unchanged immediately after a contractionary shock, reflecting pre-committed or already-initiated projects, while longer-horizon plans experience substantial downward revisions.

Next, the models incorporating adjustment costs and irreversibility include creating an option value of delaying project initiation [Arrow, 1968, Dixit and Pindyck, 1994]. Contractionary MP shocks increase

real interest rates and uncertainty, expanding the "inaction region" within which firms delay committing to irreversible expenditures. Consequently, firms will postpone or cancel discretionary and long-horizon capital expenditures more than routine maintenance or projects already underway. These models would predict inaction regions where firms are insensitive to small negative shocks when there are significant costs to scale back. They would also predict that investment categories with high irreversibility experience larger and quicker cuts in planned spending, while maintenance and ongoing-project plans remain relatively stable.

A third set of models explaining delayed investment responses incorporates information rigidity or inattention [Mankiw and Reis, 2002, Reis, 2006, Coibion and Gorodnichenko, 2015]. Firms may be slow to update their expectations regarding monetary policy and macroeconomic conditions, particularly if information acquisition is costly and policy signals are noisy. This friction implies investment responses to monetary policy shocks occur gradually, as firms slowly revise their expectations and investment outlooks over subsequent periods. Investment plan revisions following an MP shock would thus be initially small and distributed evenly across project types and horizons.

Our empirical analysis leverages detailed data on firms' forward-looking investment plans to discriminate between these theoretical channels, thereby contributing to our understanding of the precise frictions governing lagged monetary transmission to firm-level investment.

4 The Relationship between Firm Investment Decisions and Monetary Policy

In this section, we lay out our empirical strategy for using plans data to understand the interaction between monetary policy and corporate investment decisions, and then describe the results.

4.1 Empirical Strategy

Our main outcome variable of interest is planned investment, normalized by prior period actual investment and assets:

$$\text{Planned Investment}_{i,t,h} = \frac{F_{i,t}[I_{i,t+h}] - I_{i,t-1}}{Assets_{i,t-1}}. \tag{7}$$

Using this outcome variable improves upon the significant signal-to-noise ratio that typically plagues empirical analyses of the investment response to monetary policy shocks (Nakamura and Steinsson [2018]) by isolating the investment decision immediately following a given policy shock. We discuss this econometric

improvement further in Appendix A.

Our baseline regression is thus:

$$\text{Planned Investment}_{i,t,h} = \beta_h^P \, \text{MPS}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}, \tag{8}$$

where MPS_t is the monetary policy shock, $X_{i,t-1}$ are lagged firm- and macro-level controls, and α_i are firm fixed effects. Firm controls include cash-to-assets, leverage, log assets, return on assets, tangibility and Tobin's Q. Macro controls include the quarterly change in the Chicago Fed National Activity Index (CFNAI) as well as its level, the 2- year U.S. Treasury yield level, the 2-to-10 year U.S. Treasury yield slope, and four lags of GDP growth, inflation rate, and unemployment rate. Coefficient β measures the change in planned investment per dollar of capital in response to monetary policy shocks. We two-way cluster standard errors by firm and quarter throughout to account for potential serial correlation within firm and cross-sectional correlation in responsiveness to shocks.

4.2 The Effect of Monetary Policy on Investment Plans Across Different Horizons

We first estimate Equation 8 to measure the average responsiveness of investment in our sample with respect to interest rate shocks. Figure 10 shows the one-year effects on planned investment over different horizons. Cumulating these, Panel A suggests that an unexpected 1 pp contractionary monetary policy shock as defined by Bauer and Swanson [2023] today leads to a 1.39% reduction today in planned investment that is to occur over the next year, a 2.28% reduction today in planned investment that is to occur over the next two years, a 2.75% reduction today in planned investment that is to occur over the next three years, a 3.72% reduction today in planned investment that is to occur over the next four years, and a 5.53% reduction today in planned investment that is to occur over the next five years. Importantly, these results suggest that the "long and variable lags" observed in the real business investment response to monetary policy is (at least in part) immediately reflected in firm decisions and expectations following the policy shock. Figure C.5 displays comparable estimates using realized investment from the prior literature. Our estimates are broadly in line with prior estimates for near-term horizons, and suggest somewhat larger effects on investment for longer-term horizons. Panels B and C suggest that long-horizon plans respond more so than short-horizon plans to shocks further out along the yield curve. Later in the paper, we explore the mechanisms through which monetary policy affects firm investment. In those specifications, it is more natural to scale by total assets to

capture the size of variables such as cash flow expectations or issuance relative to the size of the firm rather than the firm's physical capital stock. Therefore, we re-estimate Equation 8 using $\tilde{\Delta}F_{it}[I_{i,t+1}]/A_{i,t-1}$. The results are reported in Figure C.6, and are similar.

Next, we formally test the statistical significance of the result that long-horizon plans appear to respond more so than short-horizon plans. We split investment plans into near-term and long-term, where we define a long-term investment plan as any plan that is for a projection horizon that ends greater than 12 months after the announcement of the plan. Figure C.7 shows the distribution of projection horizons, and shows that a significant share of observations includes plans for 2+ years in the future. We estimate the following specification:

$$\tilde{\Delta}F_{i,t}[I_{i,t+h}]/A_{i,t-1} = \beta_1 MPS_t^m + \beta_2 \left(LT_{i,t} \times \Delta MPS_t^m\right) + \beta_3 LT_{i,t} + \alpha_i + X_{i,t-1} + \varepsilon_{i,t} \tag{9}$$

where MPS_t^m include the sum of high-frequency changes in the U.S. Treasury future for maturity m during monetary policy events as defined in Bauer and Swanson [2023] over the fiscal quarter t. We investigate shocks for $m = (ST, 2, 5, 10, 10-2)$. Under the assumption that high-frequency changes in U.S. Treasury yields around monetary policy announcements are exogenous, we can directly estimate the impact of these shocks on investment plans (Nakamura and Steinsson [2018]), though we discuss alternative specifications below. We include the same set of controls as before.

The results for this estimation are in Table 4. The omitted category is short-term (up to 11 months ahead) plans, so we interpret the first coefficient on the yield change as the impact on near-term plans. We find that a ten basis point 2-year U.S. Treasury shock raises short-term planned capital expenditure (as a share of assets) by 0.09 percentage points while reducing long-term planned capital expenditures by around 0.1 percentage points (the sum of the base and the interaction coefficients).

The positive coefficient on short-term plans is counterintuitive in the context of standard macro models that would assume a contractionary interest rate shock should be met with a decrease in investment. However, it is consistent with models with time to build, where a credit crunch may force firms to accelerate near-term investment to generate cash flows (Fernandes and Rigato [2023]). Overall, the results suggest that long-term plans decline by relatively more following an increase in interest rates, and that this holds for increases in interest rates across the term structure, with a slightly stronger effect on the 10-year yields, which exhibit a 0.16 percentage point decline in response to a 10 basis point increase in yields.

To test how robust our result is, we run a simple OLS regression of investment plans on quarterly changes in U.S. Treasury yields. Table C.6 reports the results, which are qualitatively very similar to our baseline results in Table 4, providing us confidence in our results despite the small magnitude of the measured MPS from Bauer and Swanson [2023]. Next, to ensure the monetary policy shocks are properly accounting for the potential bias in a simple OLS setting, we report the IV version of Table C.6 in Table C.8, where we instrument for the quarterly change in each U.S. Treasury yield with the sum of 30-minute event window shocks of the duration-matched U.S. Treasury future in each MP event as defined by Bauer and Swanson [2023].[7] The first-order concern for bias in regressing investment plans on interest rate changes is that an increase in nominal interest rates may reflect a growing economy, thus rates and plans may co-move positively, biasing the OLS coefficient towards zero. Indeed, the instrumented version shows a more negative impact of positive interest rate shocks on LT investment plans, confirming our prior of the direction of the bias.

We next test the statistical differences in each plan horizon relative to near-term plans by estimating the following specification:

$$\tilde{\Delta} F_{i,t}[I_{i,t+h}]/A_{i,t-1} = \beta_1 MPS_t^m + \sum_{x=2}^{5} \beta_h \left(\mathbb{1}\{h = x\}_{it} \times \Delta MPS_t^m \right) + \alpha_i + \alpha_h + X_{i,t-1} + \varepsilon_{i,h,t} \tag{10}$$

Table 5 reports the results. Again, we see that plans regarding investment further into the future are more responsive to changes in interest rates. For example, for changes in the 5-year US Treasury yield, there is a statistically significant and negative response to plans with horizons from two to five years out, with the coefficient generally growing in magnitude as the horizon increases. Notably, the responsiveness of investment plans appears aligned with the maturity of the interest rate shocks: near-term investment plans (the baseline category) are most negatively affected by short-term shocks (representing yields up to one year), whereas investment plans projected four or five years ahead experience the strongest negative impact from shocks to the 10-year U.S. Treasury yield. Shocks to the term spread exhibit similar patterns but are not statistically significant. De Fraisse [2023] documents that secular changes in the term premium impact corporate investment duration; in a similar vein, our results provide suggestive micro-evidence that longer term investment plans are more responsive to shocks to the long end of the yield curve.

[7] Table C.7 reports that the first stage of high-frequency MP-driven changes in U.S. Treasury futures is a relevant instrument for quarterly changes in interest rates.

Collectively, these results underscore a clear relationship: the longer the planning horizon, the greater the sensitivity of investment plans to monetary policy shocks. We call this the "term structure of planned investment responsiveness". Because long-horizon plans are less likely to have begun already, they may be more flexibly adjusted than shorter horizon plans that may have already initiated planning, hiring, or permitting.

4.3 The Partial Irreversibility of Investment Plans

Next, we explore whether there is (partial) irreversibility of investment plans. We are interested in whether this is a symptom of the implementation of investment being irreversible, or whether there is some irreversibility inherent in the plan itself. To investigate this, we compare the responsiveness of firms with and without plans to monetary policy. We test the impact of having plans for a given projection horizon on policy transmission to both realized investment and planned investment.

We test relative differences in the responsiveness to monetary policy of new versus revised plans. If there is partial irreversibility in plans themselves, then existing plans should be less responsive to monetary policy, even if firms have not begun implementing them yet.

In this analysis, we separate out the effects of contractionary and expansionary shocks, following a long literature that the real effects of monetary policy are asymmetric: that is, agents are more responsive to contractionary shocks (interest rate hikes) than expansionary shocks (e.g., Tenreyro and Thwaites [2016]). Specifically, we regress planned changes in capital expenditures normalized by assets ($\tilde{\Delta}F_{i,t}[I_{i,t+h}]/A_{i,t-1}$) on the short-term and 2-year monetary policy shocks, interacted with indicators for negative shocks (expansionary policy). We then study the differential effects for new plans versus revisions of existing plans. We define new plans as investment guidance issued for a projection year for which the firm has not previously provided any guidance. We define revisions of existing plans as investment guidance issued for a projection year for which the firm has already provided guidance.

Formally, we regress:

$$\begin{aligned}\tilde{\Delta}F_{i,t}[I_{i,t+h}]/A_{i,t-1} = {} & \beta_1 MPS_t + \beta_2 MPS_t \times \mathbb{1}\{MPS_t \leq 0\} \\ & + \beta_3 \mathbf{1}\{\text{NewPlan}_{i,h,t}\} + \beta_4 MPS_t \times \mathbf{1}\{\text{NewPlan}_{i,h,t}\} \\ & + \beta_5 MPS_t \times \mathbb{1}\{MPS_t \leq 0\} \times \mathbf{1}\{\text{NewPlan}_{i,h,t}\}\end{aligned}$$

$$+ X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t}, \tag{11}$$

where we include the same controls as before, plus firm and plan horizon fixed effects.

Table 6 reports the results, using the short-term shock in Panel (a) and high-frequency changes to 2-year UST yields in Panel (b). The regressions reported in the first three columns study the impact of monetary policy shocks across the full sample of plans. Column (1) reports the results of monetary policy shocks with no controls or fixed effects, and shows a statistically significant negative effect of the B-S MPS and a counter-intuitive positive effect of the 2-year UST yield shock. Columns (2)-(3) report the effects separately for contractionary and expansionary shocks. The results indicate that a contractionary shock has a statistically significantly negative impact on investment plans, while an expansionary shock has a counter-intuitive *negative* investment response, mirroring some of the price puzzle results in the macro literature (Christiano et al. [1999]).

One interpretation of this result is that monetary policy shocks may incorporate some component of the Fed information effect, where markets learn about the Fed's private information about future economic growth prospects (Nakamura and Steinsson [2018]). If a given monetary policy shock is negative because the Fed lowers interest rates by more than expected (or raises interest rates by less than expected), this may convey information that the Fed believes the economy is worse than expected. Thus, even "good news" about interest rates may incorporate bad news about the economy; conversely "bad news" about interest rates may incorporate good news about the economy. Our results suggest that bad news has a bigger effect on planned investment than good news on both fronts: that is, firms adjust investment plans downwards for both an unexpected increase in interest rates as well as an unexpected decrease in interest rates (potentially due to the information effect).

In Columns (4)-(7) of Table 6, we examine how new plans react differently than plan revisions. The impact is nearly twice as strong in Column (4) for new plans as it is for Column (5) for the subset of plan revisions, and the latter effect is statistically weak when averaged across all plan horizons. The interaction regression reported in Columns (6)-(7) indicate that firms are significantly responsive to contractionary shocks when making new investment plans, especially those with longer projection horizons. Column (7) shows that the negative effect of monetary policy on investment plans nearly doubles for new plans with horizons over one year compared to revisions of existing plans.

This last result aligns with the idea that plans themselves are irreversible. Firms are unlikely to have

begun the implementation of investment projected to occur in several years, but yet existing plans are still less responsive than new plans over these longer horizons. This results suggests that plans are irreversible not only because of the irreversibility of implementation, but because of irreversibility of the plans themselves once created.

4.4 What Types of Investment are Cut?

We next investigate which types of investment decisions are particularly sensitive to monetary policy shocks. We observe a qualitative discussion of the kind of investment planned for roughly one-fifth of observations. We use these descriptions to classify investments into the following, non-mutually exclusive categories: maintenance, acquisitions, strategic, physical infrastructure, environmental, expansion, research and development, and new projects. For example, Mosaic Company, a large chemicals corporation, stated in its 2023 10-K "In 2025, we estimate environmental capital expenditures will be approximately $360 million and expenditures for land reclamation activities, Gypstack closure and water treatment activities are expected to be approximately $240 million." Such descriptions are classified under Environmental expenditures. As another example, Cheesecake Factory in its October 2024 10-Q stated "We anticipate approximately $180 to $200 million in cash capital expenditures to support this level of unit development, as well as required maintenance on our restaurants"; we then classify this as maintenance capital expenditures. Table C.5 presents the primary keywords utilized in our classification process to systematically identify investment types.

As an example, consider the second quarter of 2022, when the Fed Funds rate increased by 100 basis points and more than two-thirds of firms scaled back their planned investments. One such firm is Ingles Markets, a grocery store chain with approximately $1 billion in market capitalization as of March 2025. In its fiscal year 2021 10-K (ending September 25, 2021), Ingles planned capital expenditures ranging from $120 to $160 million for the fiscal year of 2022. This spending was initially designated for store openings in the fiscal year of 2023, technology enhancements, equipment upgrades and replacements for existing stores, warehouse and transportation improvements, and upgrades to its milk processing facility, alongside considerations for property acquisitions aimed at future store development. However, in its subsequent 2022 Q2 10-Q filing, following the rapid rise in interest rates, Ingles revised these plans downward to a range of $100 to $120 million, notably excluding property acquisitions intended for future store development from their planned expenditures.

To test which types of investment are most likely to be cut on average in response to monetary policy,

we run the following regression on the subsample of plans for projection horizons that end at least 9 months after announcement:

$$\mathbf{1}\{\text{InvestmentType}\}_{i,t} = \beta_1 MPS_t + \beta_2 MPS_t \times \mathbb{1}\{MPS_t \leq 0\} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}, \tag{12}$$

where the outcome variable is a dummy variable that equals one for a given category of investment and zero otherwise. Figure 11 shows the results. Panel (a) indicates that there is not a statistically significant effect of contractionary B-S MPS on investment types, consistent with our findings earlier that the B-S shock has little impact on long-term investment plans. However, Panels (b) and (c) indicate that certain investments are cut in response to positive shocks to the 2- and 10-year UST yields. Investments related to R&D, expansion and new projects respond significantly to contractionary shocks, with statistically stronger responses to shocks to the 10-year yields. These results underscore the heterogeneity of investment responses to monetary policy, highlighting stronger effects on new, potentially longer-term and growth-oriented investments compared to shorter-term or routine expenditures. This is consistent with the results on long-term investment plans being more responsive to monetary policy.

We next test how much changes in average inflation expectations are driving these adjustments in investment plans. We construct our MP-driven inflation-expectations shocks by first calculating the change in TIPS-implied breakeven inflation over a two-day window surrounding each monetary-policy event, then summing over all MP events occurring in the quarter before the plan announcement date. Figure 12 plots the estimated symmetric response of each investment category to a one-percentage-point rise in breakeven inflation expectations at the 5-year (Panel a) and 10-year (Panel b) horizons. In both panels we re-estimate equation 12, replacing the MPS with the quarterly change in TIPS-implied breakeven inflation and omitting the negative-shock interaction so that every coefficient captures the average effect of an increase in inflation expectations. In panel (a), a one-point rise in 5-year inflation expectations leads to small but statistically significant increases in planned outlays on physical infrastructure, environmental projects, R&D, expansion and, most strongly, new projects. Panel (b) displays a similar, though slightly attenuated, pattern for the 10-year breakeven shock. Positive shocks to near-term inflation expectations driven by monetary policy thus appear to increase the firm's propensity to include long-term and expansionary projects in its plans.

Studying the nature of hiring after a shock can further shed light on the kinds of investment companies may be adjusting in response to monetary policy. We run a similar analysis by using job changes in different

employment categories from the Revelio data:

$$\text{Hiring}_{it}^{\text{Job Type}} = \beta_1 \text{MPS}_t + \beta_2 \text{MPS}_t \times \mathbb{1}\{MPS_t \leq 0\} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t},$$

where we include the same controls and fixed effects as before, and we again use short-term Eurodollar shocks and 2- and 10-year UST yield shocks. Figure 13 presents the estimated impact of monetary policy shocks on hiring across seven job categories: Operations, Sales, Administration, Engineering, Finance, Marketing, and Scientist. We find that most categories experience a decline in hiring following a positive short-term shock, with Scientist and Marketing exhibiting the largest negative responses. In contrast, hiring in Admin, Finance, and Engineering appears relatively less sensitive and remains closer to zero. These results suggest that in the wake of tighter monetary policy, firms tend to reduce hiring in functions that are either more discretionary or long-term oriented. However, the hiring response to positive shocks in longer-term yields is weaker and is concentrated among Operations and Sales. This suggests that in general, hiring is more responsive to shocks to the short end of the curve, while growth-oriented and longer-term investment is more sensitive to shocks to the long-end of the curve, possibly due to borrowing constraints. In the next section, we will further explore mechanisms for the transmission of monetary policy to firm decisions.

5 Transmission Channels of Monetary Policy to Investment

Next, we explore the transmission channels of monetary policy to firm investment decisions. First, we explore firm-specific channels. Monetary policy may affect firms' investment decisions via many channels, including through a cost of capital (or discount rate) channel, or changes in cash flow expectations. The more commonly studied channel is the cost of capital channel: if firms finance investment with debt financing, then increases in the cost of debt associated with tightening monetary policy may reduce planned investment. Similarly, if firms make investment decisions based on an NPV rule where they discount future cash flows with some discount rate, contractionary monetary policy could reduce investment by increasing the discount rate firms use to assess investments. In the presence of capital market frictions that make internal funds less costly than external funds, an increase in a firm's cash flows will also result in an increase in that firm's investment (Fazzari et al. [1988]). It follows that if an increase in interest rates dampens a firm's expectations of future cash flows via an aggregate demand channel, then it is possible that the firm will reduce its planned

investment. We also consider how monetary policy-driven changes in average inflation expectations may impact investment planning, and how this may vary in the cross section of firms.

We use the new expectations data to test these transmission channels and assess their relative importance for different types of firms. The key advantage of our approach is that by using investment plans and cash flow expectations data, we observe firms' investment decisions in real time, allowing us to tie discrete adjustments in planned investment directly to contemporaneous changes in firm expectations about cash flows and costs of debt. This allows us to avoid the timing mismatches and noise inherent in realized data and better pinpoint the transmission mechanism.

5.1 Cost of Debt and Borrowing Channel

A common transmission mechanism for monetary policy to firm investment is via a borrowing channel (e.g., Bernanke and Gertler [1995]). In this section, we first demonstrate that firms' investment plans respond to monetary-policy-driven shocks to their cost of debt. We then present direct evidence on the borrowing mechanism by examining firms' net debt issuance in response to monetary policy shocks. In both sets of results, we show significant heterogeneity in the cross-section of firms.

5.1.1 Investment Plans and Cost of Debt Shocks

To measure the relationship between a firms' investment plans and the cost of debt, we construct shocks to each firm's cost of debt due to monetary policy changes $\Delta^{MP} r^D_{i,t}$ in the two-day window around each monetary policy event as defined by Bauer and Swanson [2023]. We proxy for the firm's cost of debt using the amount-outstanding weighted average yield of bonds issued by firm i. The assumption we make is that within the two-day window around monetary policy announcements, there is no other significant news about the market or firm fundamentals that affects the firms' costs of debt. Ideally, we would construct similar 30-minute high-frequency changes as in Nakamura and Steinsson [2018], Bauer and Swanson [2023], and others, but corporate bond markets are not as liquid as Treasury bond markets (e.g., Bao et al. [2011]), so we would have too few trade observations at such high frequency. Thus we use a 2-day window in the spirit of Hanson and Stein [2015]. To ensure we are indeed capturing changes in firm costs of debt arising from monetary policy changes, we first validate that these two-day changes in cost of debt are in fact monetary-policy driven. We estimate the relationship between a firms' cost of debt and monetary policy

shocks by running the following regression:

$$\Delta^{MP} r^D_{i,t} = \beta MPS_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t} \tag{13}$$

where MPS_t is the sum in quarter t of monetary policy shocks. Standard errors are clustered at the firm and quarter level. To investigate potential heterogeneity in this relationship, we also estimate the following specification:

$$\Delta^{MP} r^D_{i,t} = \beta_1 MPS_t + \beta_2 MPS_t \times \mathbb{1}\{\text{Top Tercile}\} + \beta_3 \mathbb{1}\{\text{Top Tercile}\} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t} \tag{14}$$

The results of the estimation are shown in Table 7. Overall, there is an approximately one-to-one relationship between monetary policy shocks and the cost of debt, conditional on controls, as shown in column 3. There is also heterogeneity in the strength of the pass-through of monetary policy shocks to the cost of debt along several dimensions: the pass-through is higher for large firms (Column 4) and more levered firms (Column 5). There is no significant heterogeneity in the strength of the pass-through along the dimensions of tangibility, interest expense to debt and profitability. Overall, the results demonstrate that our measure $\Delta^{MP} r^D_{i,t}$ is indeed capturing monetary-policy-driven changes in firms' costs of debt.

Equipped with this measure, we then estimate the following specification:

$$\tilde{\Delta} F_{i,t}[I_{i,t+h}]/A_{i,t-1} = \beta_1 \Delta^{MP} r^D_{it} + \beta_2 \Delta^{MP} r^D_{it} \times \mathbb{1}\{\Delta^{MP} r^D_{it} \leq 0\} + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t}, \tag{15}$$

where controls $X_{i,t-1}$ are the same as before, and α_i and α_h are firm and projection horizon fixed effects, respectively. We are interested in potential heterogeneity in the effects of positive versus negative changes in the cost of debt on investment, so we also include an interaction term with an indicator variable that switches on when the change is negative. As before, standard errors are clustered at the firm and quarter level.

The β_1 coefficient shows how projected investment changes with an increase in the firm's cost of debt. The sum of the β_1 and β_2 coefficients indicate how projected investment changes with an decrease in the firm's cost of debt. To investigate potential heterogeneity in this relationship across firms of different sizes, we also interact the cost of debt shocks with dummy variables for firms in the top tercile of size, leverage, tangibility, interest expense, and profitability.

The results of the estimation are shown in Table 8. Overall, when a firm faces an increase in the cost

of debt induced by monetary policy, they reduce their planned future investment immediately (within one quarter). The effect is slightly more pronounced for larger and more levered firms, but this heterogeneity is not statistically significant. However, firms with more tangible assets (measured as the ratio of PP&E to total assets) are significantly more responsive: a 10 basis point increase in their cost of debt would decrease planned investment by 3 percent points of assets. Firms with higher interest expense as a share of total debt are also more responsive to contractionary monetary policy, while more profitable firms (as measured by net income over assets) are slightly less so.

5.1.2 Borrowing Channel

Next, we directly test for the borrowing channel: that is, do firms respond to monetary policy shocks with changes in borrowing behavior? To trace out the borrowing channel, we estimate how a one-period policy shock alters firms' debt-issuing behavior over multiple horizons. Concretely, for each month horizon $h_m = 0, 1, \ldots, 24$, we run regressions of the form:

$$\frac{\sum_{\tau=0}^{h_m} \text{NetIss}_{i,t+\tau}}{A_{i,t-1}} = \beta_{h_m} MPS_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h_m},$$

where $\text{NetIss}_{i,t+\tau}$ is firm i's net debt issuance in quarter $t+\tau$ deflated to time t dollars using PPI, and we include the same controls and fixed effects as before. Figure 14 shows the average results across all firms, using different monetary policy shocks. There is a statistically significant decline in net issuance in response to positive monetary policy shocks, and this is consistent across different kinds of shocks, though it is slightly more pronounced for shocks to the 2-year UST yield. The effect persists for up to one year after a given shock. The cumulative response pattern implies that tighter policy raises firms' cost of debt, leading them to cut back planned borrowing over time. In turn, this reduction in credit supply could dampen their ability to execute longer-horizon investment projects. It is not as strong for shocks in the 10-year UST yield, shown in Panel (c).

We next explore heterogeneity in the borrowing response to monetary policy by running the same specification for subsamples of firms, split by top tercile and bottom two terciles. The results are in in Figure 15. The most pronounced dimensions of heterogeneity are that firms with higher interest expense ratios and lower profitability face larger contractions in response to positive shocks to their costs of debt, consistent with a financing constraint story. Firms with higher asset tangibility also face significant and more

prolonged declines in borrowing, consistent with tighter collateral constraints. More levered and larger firms respond with slightly larger magnitudes, but the differences are very small and insignificant. Figure C.9 in the Appendix shows similar heterogeneous responses to shocks to the 2-year UST yield. Collectively, these findings highlight the significant role firm-specific financial characteristics play in shaping the heterogeneous transmission of monetary policy to firm-level investment outcomes.

It is important to note that because these regressions utilize realized borrowing rather than planned borrowing, they inherently face similar concerns about noise and potential biases as discussed in Section 4. Nonetheless, the coefficient plots in Figure 14 indicate notably shorter response lags for borrowing compared to investment. Borrowing responses peak between 9 and 12 months following a monetary policy shock (consistent with, for example, Christiano et al. [1994]), whereas realized investment responses typically peak between 2 to 3 years, as documented in existing literature (Cloyne et al. [2023]). Supporting evidence from recent studies also suggests near-immediate borrowing responses to shifts in issuance costs (Boyarchenko et al. [2022], Darmouni and Siani [2022], Mota and Siani [2023], Selgrad [2023], Siani [2021]), likely facilitated by frequent issuers and firms holding shelf registrations. Consequently, borrowing responses to monetary policy shocks face less severe signal-to-noise concerns compared to investment reactions.

Collectively, these results strongly indicate that the borrowing channel is operative, with firms adjusting their debt issuance behavior significantly in response to monetary policy-induced shifts in borrowing costs. The immediate response of plans to monetary policy-driven increases in costs of debt may thus reflect firms anticipating reducing bond issuance in the future and thus reducing funds for future investments. Moreover, the considerable cross-sectional variation underscores that financial constraints materially shape firms' investment sensitivity to monetary policy.

5.2 Cash-Flow Expectations Channel

To study the relationship between a firms' investment plans and projected cash flows, we estimate the following specification:

$$\tilde{\Delta}F_{i,t}[I_{i,t+h}]/A_{i,t-1} = \beta\tilde{\Delta}F_{i,t}[CF_{i,t+h}] + X_{i,t-1} + \alpha_i + \alpha_t + \varepsilon_{i,h,t}, \tag{16}$$

where $\tilde{\Delta}F_{i,t}[CF_{i,t+h}]$ is firm i's projected real net income for a future period $t+h$, projected in quarter t, compared to actual net income in quarter t, scaled by the firms' assets as of quarter $t-1$. $\tilde{\Delta}F_{i,t}[I_{i,t+h}]$ is the

analogous term for projected investment. This specification is similar to Gennaioli et al. [2016b], which uses CFO survey responses to test how increased earnings expectations impact investment plans. Controls $X_{i,t-1}$ include the same firm controls and macro controls as before. α_i and α_t are firm and quarter fixed effects, respectively. Standard errors are clustered at the firm and quarter level.

The β coefficient shows how projected investment for a given future period changes with projected net income for the same future period. To investigate potential heterogeneity in this relationship across firms with different characteristics, we also estimate the following specification:

$$\begin{aligned}\tilde{\Delta}F_{i,t}[I_{i,t+h}]/A_{i,t-1} = \beta_1\tilde{\Delta}F_{i,t}[CF_{i,t+h}] + \beta_2\tilde{\Delta}F_{i,t}[CF_{i,t+h}] \times \mathbb{1}\{\text{Top Tercile}\} \\ + \beta_3\mathbb{1}\{\text{Top Tercile}\} + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t}\end{aligned} \tag{17}$$

where $\mathbb{1}\{\text{Top Tercile}\}$ refers to whether a firm is in the top tercile for a given characteristic as of the end of quarter $t-1$. We investigate heterogeneity along the dimensions of size, leverage, tangibility, interest expenses relative to debt, and profitability. The β_2 coefficient shows whether the relationship between projected cash flows and projected investment changes conditional on a firm being in the top tercile of these characteristics.

The results of the estimation are shown in Table 9. Overall, there is a positive relationship between projected cash flows and planned investment, as shown in the first column. When firms project greater net income for some future period, they also adjust their planned investment for that future period upwards. This effect occurs predominantly in the smallest two third of firms, and does not seem as important for the largest firms, as shown in the column 4. This is an intuitive result that resembles the finding in Fazzari et al. [1988] that more financially constrained firms, which tend to be smaller, have greater investment sensitivity to cash flow. Columns 5-8 suggest that there is not significant heterogeneity in the relationship between projected cash flows and projected investment along the other dimensions.

Next, we study the relationship between a firm's expected future cash flows and monetary policy. We estimate the following specification:

$$\tilde{\Delta}F_{i,t}[CF_{i,t+h}]/A_{i,t-1} = \beta_1 MPS_t + \beta_2 MPS_t \times \mathbb{1}\{MPS_t \leq 0\} + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t} \tag{18}$$

where MPS_t is the sum of quarter t monetary policy shocks. To estimate potential asymmetry in effects between tightening and loosening monetary policy, we include an interaction term that indicates whether the total shock in a quarter was negative. The interpretation of the β_1 coefficient is the effect of a contractionary (positive) monetary policy shock on cash flow projections. To get the effect of an expansionary (negative) monetary policy shock on cash flow projections, one adds the β_1 and β_2 coefficients. Controls $X_{i,t-1}$ and α_i, are defined as above, and α_h is projection horizon fixed effects. Standard errors are clustered at the firm and quarter level. To investigate potential heterogeneity in this relationship, we also estimate the following specification:

$$\begin{aligned}\tilde{\Delta}F_{i,t}[CF_{i,t+h}]/A_{i,t-1} = \beta_1 MPS_t + \beta_2 MPS_t \times \mathbb{1}\{MPS_t \leq 0\} + \beta_3 MPS_t \times \mathbb{1}\{\text{Top Tercile}\} \\ + \beta_4 MPS_t \times \mathbb{1}\{\text{Top Tercile}\} \times \mathbb{1}\{MPS_t \leq 0\} + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t} \qquad (19)\end{aligned}$$

The results of these estimations are shown in Table 10. Overall, there is a negative relationship between projected cash flows and contractionary monetary policy shocks, as shown in Columns (2) and (3). In the face of a contractionary monetary policy shock, firms adjust their projected cash flows downwards. However, the coefficient on the expansionary shock is positive and statistically and economically significant. Just as with planned investment, net income forecasts decline when there is a negative monetary policy shock, suggesting that the bad economic news associated with a negative interest rate shock affects firm expectations about their future profits. There is heterogeneity in this relationship along the size dimension, with firms in the largest size tercile not adjusting their projected cash flows downwards in response to contractionary shocks. Thus, firms in the smaller two terciles in our sample are the ones that drive the downward revision in cash flows expectations in response to contractionary shocks. Along the other dimensions of leverage, tangibility, interest expense over debt and profitability, there does not seem to be significant heterogeneity.

5.3 Inflation Expectations Channel

Increases in inflation expectations when nominal discount rates are sticky can reduce real hurdle rates, thus stimulating investment (Fukui et al. [2024]). On the other hand, increases in expected inflation can affect firms' expected profitability and thus lead to adjustments in their capital investment decisions (Coibion et al. [2018], Coibion et al. [2020]). We can test this channel directly in a manner similar to what Coibion et al. [2020] does with survey data from Italian firms, by regressing our investment plans on monetary policy

driven inflation shocks, and test how the responsiveness varies in the cross section of firms. Specifically, we run:

$$\begin{aligned}\tilde{\Delta}F_{i,t}[I_{i,t+h}]/A_{i,t-1} = \beta_1 \Delta^{MP}\pi^e_{5y,t} + \beta_2 \left(\Delta^{MP}\pi^e_{5y,t} \times \mathbb{1}\{\Delta^{MP}\pi^e_{5y,t} \leq 0\}\right) \\ + \beta_3 \left(\Delta^{MP}\pi^e_{5y,t} \times \mathbb{1}\{\text{Top Tercile}\}\right) + \beta_4 \left(\Delta^{MP}\pi^e_{5y,t} \times \mathbb{1}\{\text{Top Tercile}\} \times \mathbb{1}\{\Delta^{MP}\pi^e_{5y,t} \leq 0\}\right) \\ + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t},\end{aligned} \tag{20}$$

where $\tilde{\Delta}F_{i,t}[I_{i,t+h}]$ is firm-i's planned real capex growth for horizon h (normalized by prior period assets), $\Delta^{MP}\pi^e_{5y,t}$ is the surprise in five-year expected inflation around monetary policy announcements, and $\mathbb{1}\{\text{Top Tercile}\}$ refers to whether a firm is in the top tercile for a given characteristic as of the end of quarter $t-1$.

Table 11 shows that a one-unit surprise in the five-year inflation sharply reduces firms' planned real capex—by roughly 1.3 percentage points. Interestingly, firms facing a disinflationary surprise (the "Neg change" interaction) also reduce their investment, as evidenced by a positive and highly significant interaction in every specification. In columns 4–8 we further split the sample into firms in the top tercile of size, leverage, tangibility, interest-expense/debt, or profitability. Larger firms appear to be less affected by inflation, while firms with more tangible assets are more affected.

6 Discussion

We contribute new evidence on how firms adjust investment plans in response to monetary policy. Our results support the existence of a distinct planning phase, in which firms begin formulating investment plans before capital is deployed, consistent with "time to plan" models (such as Christiano and Todd [1996]). However, while such models typically treat planning as a one-time decision, we find that firms also revise their plans over time.

Our results indicate that new and longer-term investment plans are comparatively more sensitive than existing investment plans. These patterns suggest that firms differ significantly in their flexibility to adjust investment decisions across different kinds of projects, thus affecting the overall transmission of monetary policy. We interpret this as evidence of inertia in firm decision-making. Notably, this type of rigidity is distinct from models of rational inattention or sticky information (Mankiw and Reis [2006], Reis [2006]),

in which agents incur costs when acquiring and processing information and thus act upon outdated news. Our results demonstrate that firms begin updating their expectations –such as anticipated changes in net income– quickly in response to monetary policy shocks. Moreover, firms start adjusting their investment plans immediately in response to changes in their secondary market bond yields, again implying that firms' information sets update quickly. In line with time-to-build models (such as Kydland and Prescott [1982]), investment plans respond immediately to monetary policy shocks, reflecting firms' forward-looking behavior. The one-period adjustment is rather large for longer-term plans, which suggests limited convex adjustment costs in planning, as those would imply a more incremental adjustment over several quarters for these longer-term plans.

Firms appear to face decision inertia arising from other frictions, such as the irreversibility of investment once implementation begins, the irreversibility of plans themselves, and uncertainty. Once a project is initiated, firms behave as though the investment decision is largely committed, with marginal changes in financing conditions having limited influence on completion. The term structure of investment plan responsiveness illustrates that capital outlays planned for the near future are harder to adjust. Given that near-term plans are likelier to already be in the process of implementation, this suggests that investment is partially irreversible once implementation has begun. These findings align with frameworks where firms treat investment decisions as exercising real options (Dixit and Pindyck [1994], Abel and Eberly [1994]). Specifically, longer-horizon investment plans, which are less likely to have been "exercised," display greater flexibility in adjusting to policy shocks, supporting models of partially irreversible investment under uncertainty. In addition, we provide evidence for the partial irreversibility of investment plans themselves. We show that existing plans respond less than new plans, even for investment in the distant future, suggesting irreversibility in planning itself - distinct from implementation irreversibility. Once a plan is recorded - likely reflecting board approval and internal commitment - it becomes less responsive to new information, even if physical investment has not yet begun. This indicates that formalizing a plan creates a friction, potentially due to internal constraints, reputational costs, or sunk planning costs. This points to promising avenues for future research on the institutional mechanisms underlying the observed irreversibility in corporate planning.

Our results provide novel evidence for these decision frictions impacting the well-documented lags in monetary transmission to real activity. We show that much of the effect on realized investment originates from changes in investment plans and subsequent follow-through in actual spending. This mechanism explains the delay in policy impact: monetary policy immediately influences planned future investment projects,

especially those that are planned to occur several years into the future, but actual spending responses occur only when these planned projects commence. Importantly, even if spending has not occurred, decisions already made are difficult to adjust. For policymakers, our findings underscore why the full impact of rate changes on output often materializes only after several quarters, as firms first adjust planning–especially for discretionary investments–before these adjustments ultimately translate into aggregate spending.

Finally, our transmission mechanism analysis shows direct evidence that firms adjust their cash flow expectations in response to monetary policy shocks. Together with the strong correlation between planned investment and cash flow expectations, these results suggest that for certain firms, the expectation of lower cash flows following a contractionary monetary policy shock (either via reduced sales or higher interest expense) could reduce investment plans. This effect is particularly strong for firms that are not in the largest tercile by size. This may reflect that smaller firms may be more likely to finance investment using internal capital, which is less costly than raising external financing (Myers and Majluf [1984], Fazzari et al. [1988]). Meanwhile, the finding that firms with more tangible assets are more responsive to changes in their cost of debt is consistent with models of financing frictions (e.g., Bernanke and Gertler [1995]), and the idea that the rise in intangible assets may reduce the efficacy of monetary policy transmission (David and Gourio [2023]). Importantly, our findings show that firms adjust their investment plans immediately in response to changes in cost of debt, even if it takes a few months for their borrowing behavior to adjust.

7 Conclusion

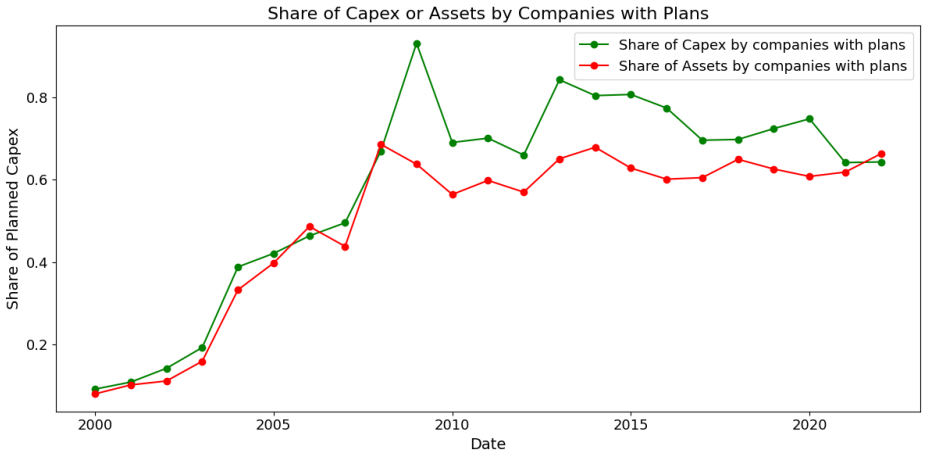
We hand-collect and construct a novel dataset on company investment plans and expectations that provides a unique window into corporate decision-making and how it relates to monetary policy transmission. We document evidence of decision inertia: once a plan for an investment project is made, it is less responsive to monetary policy. Relatedly, the stage of planning matters–new investments and long-run, growth-oriented projects are more responsive to contractionary monetary policy shocks, whereas existing projects with sunk costs are largely insulated–indicating that monetary policy mainly influences the initiation of new projects rather than prompting widespread cancellation of ongoing investments. We show that investment responses differ by horizon: short-term plans react less strongly overall compared to long-term plans, underscoring the importance of flexibility. Our results are broadly consistent with a view of investment implementation with partial irreversibility (Abel and Eberly [1994], Dixit and Pindyck [1994]). We also find evidence that there

may be irreversibility inherent in the plans themselves, even prior to the start of implementation. This raises important questions for future work on the institutional sources of rigidity in firms' planning processes.

Additionally, our results provide new evidence explaining the well-documented empirical lag between monetary policy changes and realized output. We find that monetary policy immediately impacts the formation of new investment plans, with actual investment spending adjustments materializing only when projects begin execution. Consequently, investment plans data can potentially serve as early indicators for future realized investment responses. Moreover, we find direct evidence of the mechanism through which monetary policy influences corporate investment decision. Smaller firms are more affected by a change in cash flow expectations, while firms with greater shares of tangible assets and higher interest expense ratios are more sensitive to changes in borrowing costs.

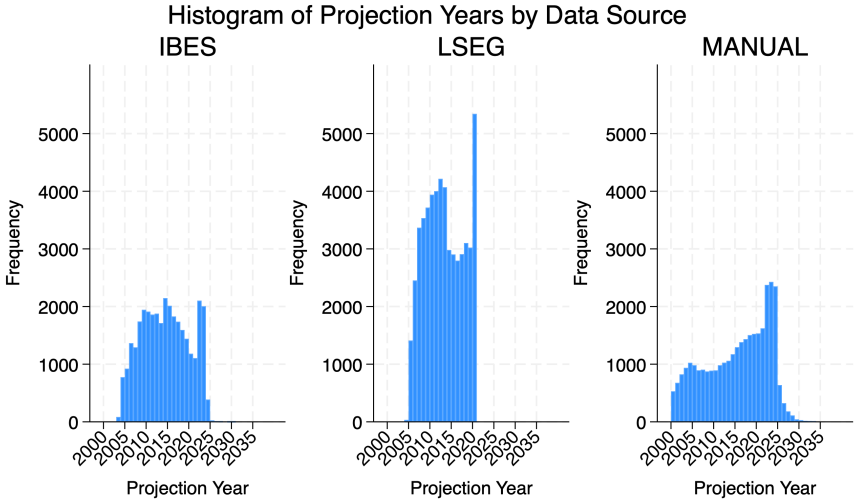
Overall, our evidence shows that analyzing corporate decision making is crucial for understanding the transmission of policy to the aggregate economy. While the focus of our paper is on monetary policy, our results provide important insights into firm responses to shocks and policies in general. Institutional frictions within corporations can restrict managers' abilities to change the course of investment plans that are already under way. Thus, more research on the nature of these institutional frictions will improve our understanding of how financial market shocks transmit through firms to the real economy.

Figure 1: Share of Capex and Assets by Companies with Plans



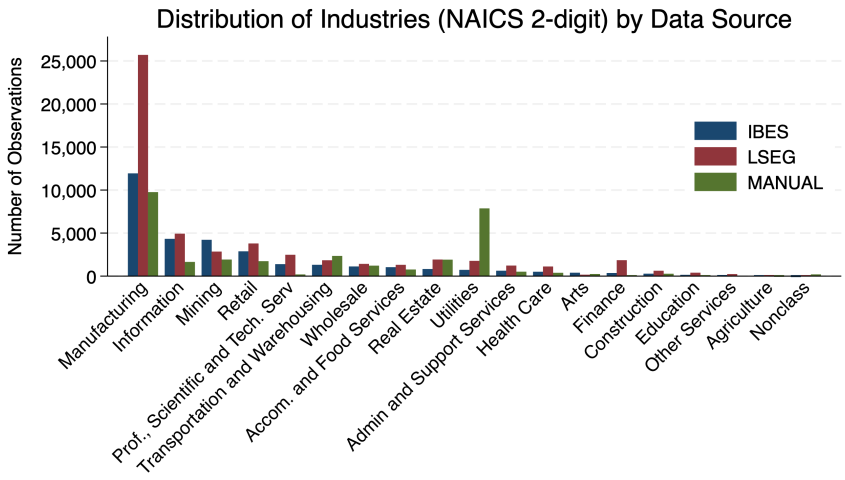
Notes: This figure plots the share of total assets (total capex) across all U.S. Compustat non-financial companies in red (green) that are covered by firms with investment plans in our sample.

Figure 2: Coverage of Projected Years Across Sources



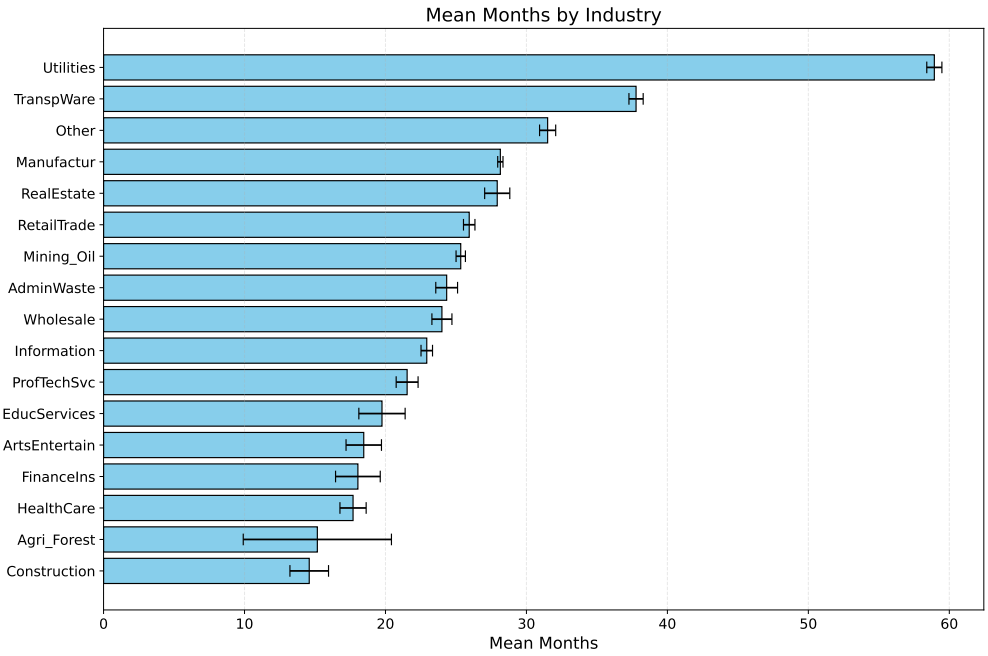
Notes: These three histograms each show the distribution of firm-announcement date observations for a given source.

Figure 3: Coverage of Industries Across Sources



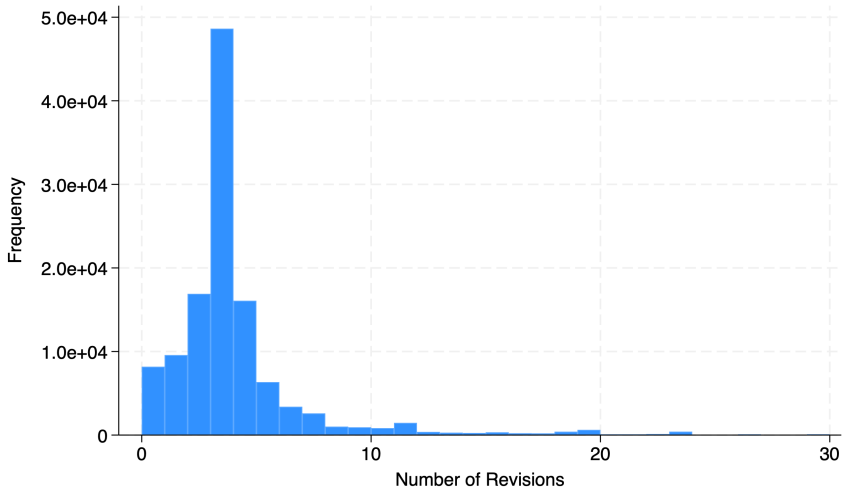
Notes: This histogram shows the distribution of investment plans (firm-announcement date-projection year observations) present for across industries in the dataset, indicating the source of the data.

Figure 4: Industry-level mean months to end of plan



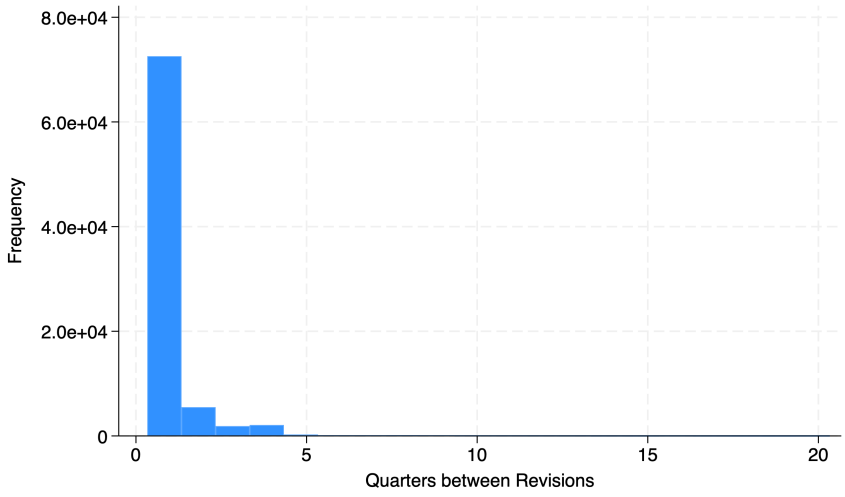
Notes: This table summarizes the average projection period by industry across all firm quarters, conditional on the firm-quarter having an investment projection. Standard error bars are reported in black.

Figure 5: Number of Revisions to a Given Plan



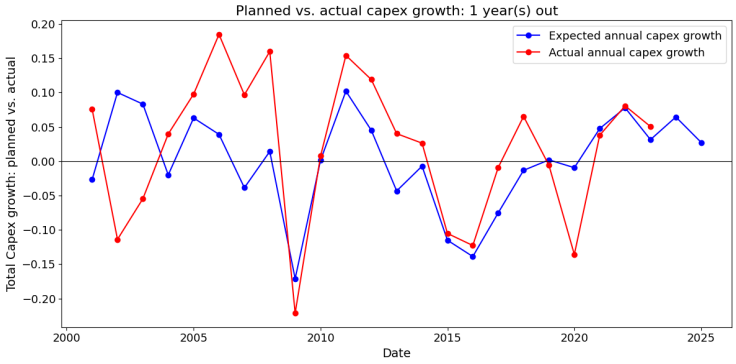
Notes: This histogram shows the distribution of the number of revisions to a given plan (for a given firm and projection period)in the dataset, including IBES, LSEG and the manually collected data.

Figure 6: Quarters between Revisions to a Given Plan

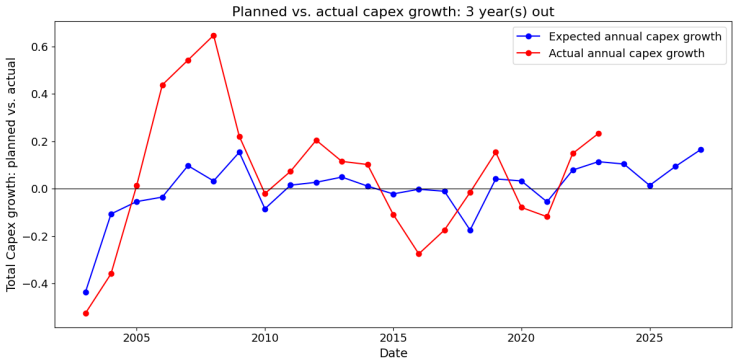


Notes: This histogram shows the distribution of the quarters between revisions to a plan (for a given firm and projection period) in the dataset, including IBES, LSEG and the manually collected data.

Figure 7: Comparing Planned vs. Actual Investment



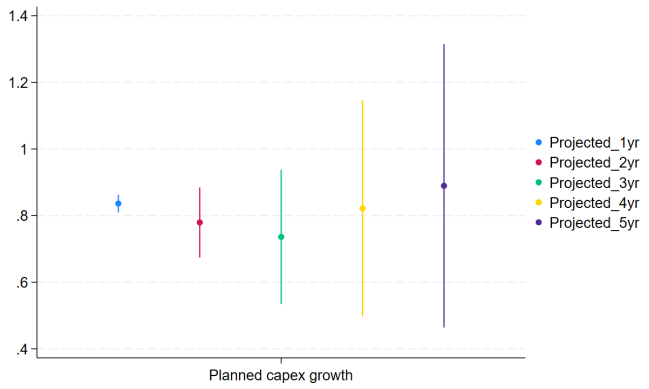
(a) Planned vs. Actual Capex Growth: 1 Year Out



(b) Planned vs. Actual Capex Growth: 3 Years Out

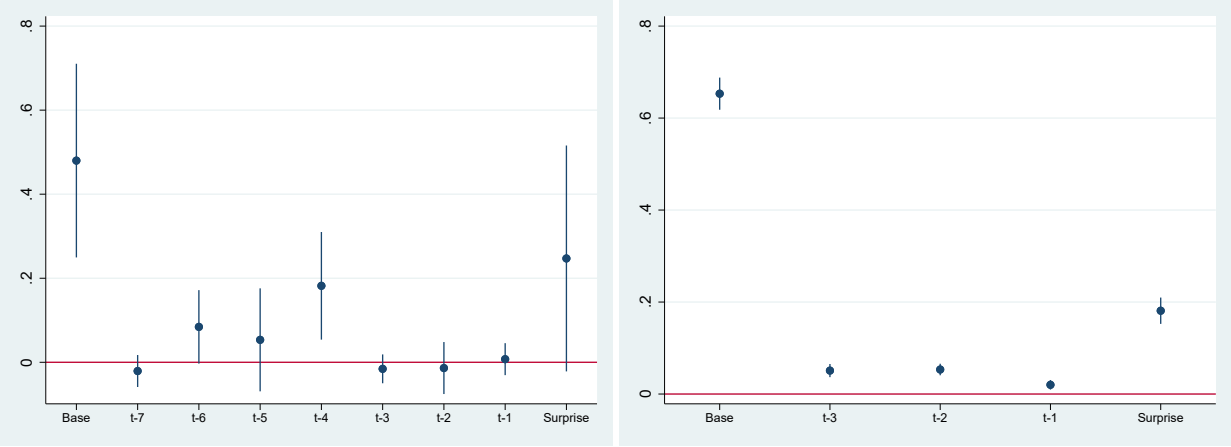
Notes: This figure compares realized and planned capex growth rates. In Panel (a), the blue line shows the percentage change in aggregate planned capex relative to one year earlier, while the red line shows the realized capex growth over the same period. In Panel (b), the blue line plots planned capex growth relative to three years prior, and the red line plots capex growth relative to three years prior.

Figure 8: Predictiveness of Investment Plans at Different Projection Horizons



Notes: This figure shows the coefficient of a regression of $\frac{I_{i,t+h}-I_{i,t-1}}{I_{i,t-1}} = \beta_h \frac{\mathbf{F}_{it}[I_{i,t+h}]-I_{i,t-1}}{I_{i,t-1}} + \alpha_i^h + \varepsilon_{i,t}^h$, with standard errors clustered at the firm and quarter level.

Figure 9: Variance Decomposition

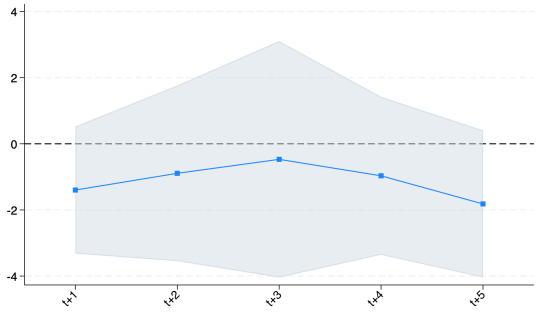


(a) Eight quarters

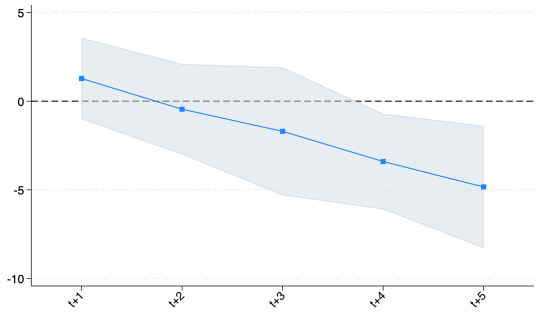
(b) Four quarters

Note: This figure shows the coefficients of a regression: $Y_{i,t-s} = \beta_s I_{it} + \alpha_i + e_{sit}$. The sample is a balanced panel at the firm (i)-projection year (t)-quarter prior to projection year (s) level from 2000 to 2024 (projection year), condition on the firm-projection year pairs with all S-quarters of projection. The independent variable is realized capital expenditure as reported in Compustat, and the dependent variable is defined as $Y_{i,t-s} = \Delta_{i,t-s}\ \forall s$, $Y_{i,t-s} = \mathbf{F}_{i,t-s}[I_{it}]$ when $s = S$, and $Y_{i,t-s} = surprise_{it}$ when $s = 0$. Firm fixed effects are included. Standard errors are clustered at the firm level. All variables are winsorized at 1st and 99th percentiles.

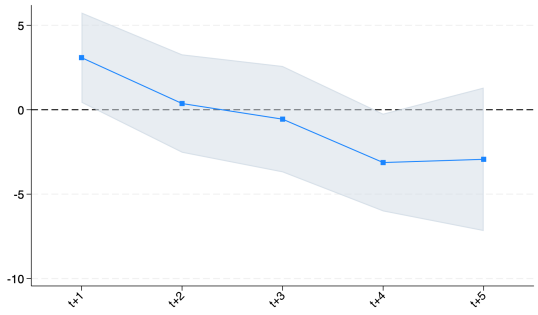
Figure 10: Impact of Monetary Policy Shocks on Investment: $\tilde{\Delta}F_{i,t}[I_{i,t+1}]/K_{i,t-1}$



(a) Bauer-Swanson MPS



(b) Shock 2y



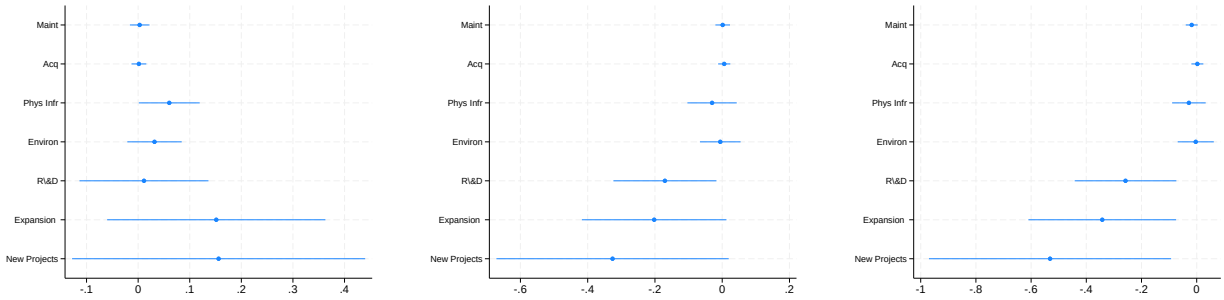
(c) Shock 10y

Notes: This figure depicts β_h^P for the following specification, for $h = 1,2,3,4,5$:

$$\tilde{\Delta}F_{i,t}[I_{i,t+1}]/K_{i,t-1} = \beta_h^P \,\text{MPS}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}, \tag{21}$$

where h denotes the years from today that the plan is for. Here, $h = 1$ if the difference between the projection date and the end of the projection horizon is between 6-18 months, $h = 2$ if the difference is between 18-30 months, $h = 3$ if the difference is between 30-42 months, $h = 4$ if the difference is between 42-54 months, and $h = 5$ if the difference is between 54-70 months. Panel (a) uses the Bauer and Swanson [2023] shock, Panel (b) uses the high frequency change in the 2-year UST yield, and Panel (c) uses the high frequency change in the 10-year UST yield. The regression controls $X_{i,t-1}$ include firm-level characteristics (cash-to-assets, leverage, log assets, return on assets, tangibility, and Tobin's Q), the quarter change in the CFNAI index, the level of the CFNAI index, the 2-, 5-, and 10-year U.S. Treasury yields, all as of quarter $t-1$, as well as four lags of GDP growth, the inflation rate and the unemployment rate. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level. The shaded area represents 90% confidence intervals.

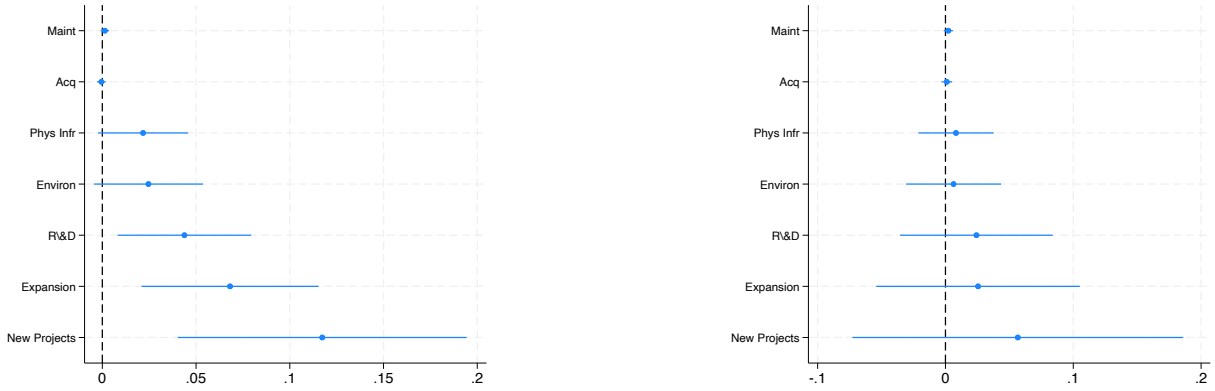
Figure 11: Investment Type Responses to Positive Monetary Policy Shocks



(a) Bauer-Swanson MPS (Positive) (b) 2-Year UST (Positive) (c) 10-Year UST (Positive)

Notes: Reports the estimated coefficient on a positive monetary policy shock for different investment types. Panel (a) shows the effect of a positive short-term monetary policy shock; panel (b) of a positive 2-year Treasury shock; panel (c) of a positive 10-year Treasury shock. All shocks are aggregated at quarter end. Only observations with at least nine months remaining in their forecast horizon are included, and all underlying regressions control for firm fixed effects, firm characteristics and macroeconomic variables.

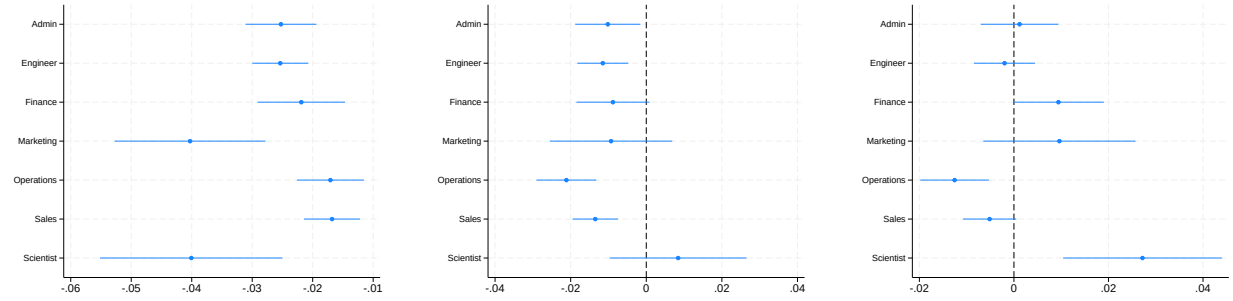
Figure 12: Investment Type Responses to Monetary Policy Shocks



(a) 5-Year Inflation Shock (b) 10-Year Inflation Shock

Notes: Each marker plots the estimated coefficient from re-estimating Equation 12 with our quarterly-aggregated TIPS-implied breakeven-inflation shock (constructed by summing two-day changes around each policy announcement) in place of the original MPS_t, and omitting the negative-shock interaction so that coefficients capture the symmetric response to a one-percentage-point rise. Panel (a) reports results for 5-year breakeven shocks; panel (b) for 10-year shocks. Shocks are aggregated to the quarter-end forecast date. The sample is restricted to firm-quarter observations with at least nine months remaining in their forecast horizon. All specifications include firm fixed effects, a vector of firm characteristics, and standard macroeconomic controls. Horizontal bars show 95 percent confidence intervals; the dashed vertical line marks zero (no effect).

Figure 13: Effect of Positive Monetary Policy Shocks on Hiring by Job Category



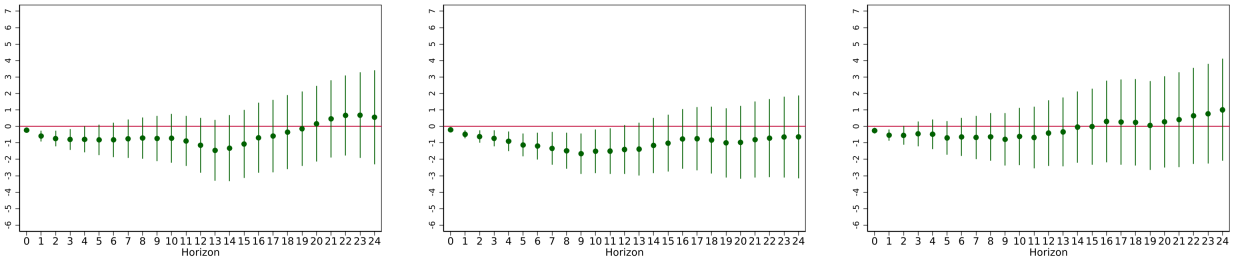
(a) Bauer-Swanson MPS (Positive) (b) 2-Year UST (Positive) (c) 10-Year UST (Positive)

Note: This figure shows coefficient estimates and 95% confidence intervals from the regression

$$\text{Hiring}_{i,t}^{\text{Job Type}} = \beta_1 \,\text{MPS}_t + \beta_2 \,\text{MPS}_t \times \mathbb{1}\{MPS_t \leq 0\} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t},$$

where $\text{Hiring}_{it}^{\text{Job Type}}$ is the change in hiring for job category (e.g., Operations, Sales, etc.) at firm i in period t, and MPS_{it} denotes monetary policy shocks. The vector $\mathbf{X}_{it}$ includes firm-level controls, macro controls, and any other relevant covariates, and α_i are firm fixed effects. Panel (a) shows the effect of a positive short-term monetary policy shock; panel (b) of a positive 2-year Treasury shock; panel (c) of a positive 10-year Treasury shock. Standard errors are clustered at the firm and fiscal quarter level. Negative coefficients indicate that higher monetary policy shocks are associated with a reduction in hiring for that job category.

Figure 14: Cumulative Real Net Issuance Response to Monetary Policy



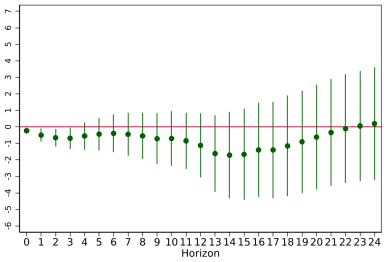
(a) Bauer-Swanson Shock (b) 2Y UST Shock (c) 10Y UST Shock

Note: The figure plots the coefficients and 95% confidence intervals from the regressions

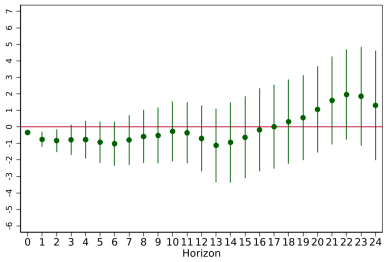
$$\sum_{0}^{h} RealNetIss_{i,t+h}/A_{i,t-1} = \beta_h MPS_{t-1} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}$$

with $h = (0, 1, ..., 24)$. Firm fixed effects are included, and standard errors are clustered at the firm and month level. The cumulative real net issuance is normalized by the previous-quarter asset and winsorized at the 1st and 99th percentiles. Panels (a) use the short-term shock, while Panels (b) and (c) use the high-frequency change in the 2- and 10-year UST yield, respectively. The sample is monthly, covering the period from 2000 to 2024. Standard errors are clustered by firm and month.

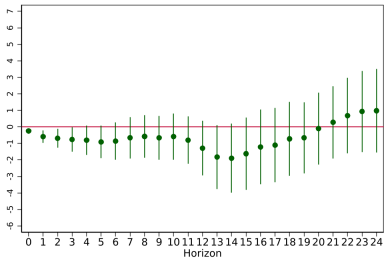
Figure 15: Heterogeneity in Cumulative Real Net Issuance Response to Monetary Policy



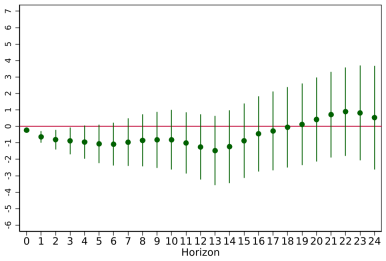
(a) Top 1/3, Asset



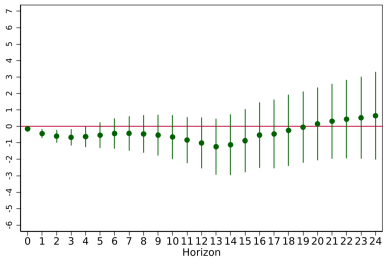
(b) Top 1/3, Leverage



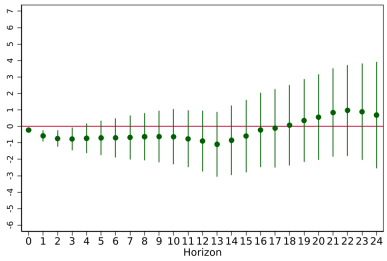
(c) Top 1/3, Tangibility



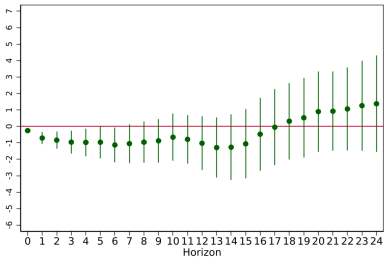
(d) Bottom 2/3, Asset



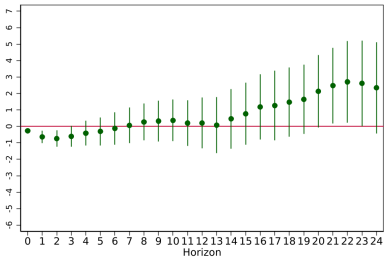
(e) Bottom 2/3, Leverage



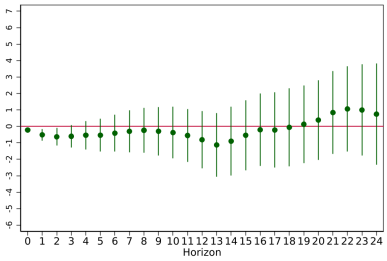
(f) Bottom 2/3, Tangibility



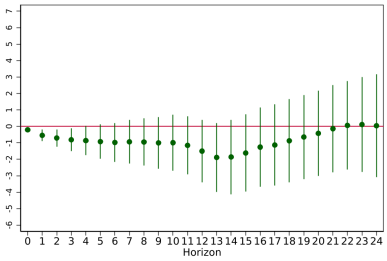
(g) Top 1/3, Int Exp/Debt



(h) Top 1/3, ROA



(i) Bottom 2/3, Int Exp/Debt



(j) Bottom 2/3, ROA

Note: The figure plots the coefficients and 95% confidence intervals from the regressions $\sum_0^h RealNetIss_{i,t+h}/A_{i,t-1} = \beta_h MPS_{t-1} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}$ with $h = (0, 1, ..., 24)$ running from 0 to 24. Firm fixed effects are included, and standard errors are clustered at the firm and month level. The cumulative real net issuance is normalized by the previous-quarter asset and winsorized at the 1st and 99th percentiles. MPS_t is the sum of monetary policy shocks occurring in quarter t. The sample is monthly, covering the period from 2000 to 2024. Subsamples (top 1/3 or bottom 2/3) are used for the relevant characteristics variable. The firm characteristics are size (ln Assets), leverage (Total Debt/Assets), tangibility (PPE/Assets), interest expense to debt (Interest Expense/Total Debt), and profitability (NI/Assets). Standard errors are clustered by firm and month.

Table 1: Summary Statistics for Firm Characteristics: All Plans vs Compustat

				Plans				Compustat
Variable	Mean	25th	Median	75th	Mean	25th	Median	75th
Number of Firms	4,136				44,047			
Number of Quarters	49.43	30.00	52.00	69.00	61.23	33.00	61.00	97.00
Total Assets	10992.72	856.96	2405.75	7527.49	4476.73	41.06	365.38	2001.22
Return on Equity	0.05	0.01	0.03	0.05	-0.06	-0.03	0.02	0.04
Tobin's Q	3.71	1.36	2.20	3.73	5.39	1.06	1.80	3.63
Investment Rate	-0.01	-0.02	-0.00	0.02	-0.06	-0.05	-0.01	0.01
Asset Tangibility	0.32	0.11	0.24	0.49	0.21	0.02	0.11	0.32
Z-Score	3.78	1.34	2.40	4.28	-6.82	0.18	1.92	4.65
Leverage	0.29	0.13	0.28	0.41	0.54	0.03	0.19	0.41
Cash/Assets	0.12	0.02	0.07	0.17	0.20	0.03	0.08	0.28

Notes: This table presents summary statistics comparing firms in our investment plans sample to the broader Compustat universe from 2000-2023. The plans sample includes all firms with at least one investment plan announcement. Total assets are in billions of dollars. ROE is net income divided by book equity. Tobin's Q is market value of assets divided by book value of assets. Investment rate is capital expenditures divided by lagged assets. Tangibility is net PP&E divided by total assets. Z-score is Altman's Z-score. Leverage is total debt divided by total assets. Cash/Assets is cash and short-term investments divided by total assets. Forecasted NI and Capex growth are the firm's projected growth rates from investment plan announcements.

Table 2: Stickiness of Investment Plans

	(1) Planned CAPX/Assets	(2) Planned CAPX/Assets	(3) Planned CAPX/Assets	(4) Planned CAPX/Assets	(5) Planned CAPX/Assets	(6) Planned CAPX/Assets
L.Planned CAPX/Assets	0.817***			0.816***		
	(0.010)			(0.010)		
L2.Planned CAPX/Assets		0.713***			0.709***	
		(0.015)			(0.014)	
L3.Planned CAPX/Assets			0.617***			0.598***
			(0.030)			(0.029)
LT Plan=1				-0.003**	-0.005**	-0.010***
				(0.002)	(0.002)	(0.003)
LT Plan=1 × L.Planned CAPX/Assets				0.035*		
				(0.020)		
LT Plan=1 × L2.Planned CAPX/Assets					0.059**	
					(0.026)	
LT Plan=1 × L3.Planned CAPX/Assets						0.100***
						(0.031)
Firm FEs	Y	Y	Y	Y	Y	Y
R^2	0.896	0.848	0.782	0.896	0.848	0.783
N	40,264	21,773	7,674	40,264	21,773	7,674

Notes: This shows results for the following specification for our collected data:

$$\frac{F_t[I_{i,t+h}]}{A_{i,t-1}} = \beta \frac{F_{t-\ell}[I_{i,t+h}]}{A_{i,t-\ell-1}} + \alpha_i + \epsilon_{i,t,h} \tag{22}$$

$F_t[I_{i,t+h}]$ is firm i's investment plan for a given year $t+h$ made in quarter t, and $F_{t-\ell}[I_{i,t+h}]$ is firm i's investment plan for the same future year $t+h$, made in quarter $t-\ell$. In columns 4-6, a long-term plan is defined as a plan that at time t is for a period that ends more than one year into the future.

Table 3: Interaction between Stickiness of Investment Plans Change and the Macroeconomic Environment

	(1) Planned CAPX/Assets	(2) Planned CAPX/Assets
L.Planned CAPX/Assets	0.802***	0.821***
	(0.011)	(0.010)
Upturn=1	-0.001***	
	(0.000)	
Upturn=1 × L.Planned CAPX/Assets	0.028***	
	(0.008)	
Crisis=1		-0.001
		(0.001)
Crisis=1 × L.Planned CAPX/Assets		-0.033**
		(0.014)
Firm FEs	Y	Y
R^2	0.897	0.897
N	40,264	40,264

Notes: This shows results for the following specification for our collected data:

$$\frac{F_t[I_{i,t+h}]}{A_{i,t-1}} = \beta \frac{F_{t-\ell}[I_{i,t+h}]}{A_{i,t-\ell-1}} + \gamma State_t + \lambda \frac{F_{t-\ell}[I_{i,t+h}]}{A_{i,t-\ell-1}} \times State_t + \alpha_i + \epsilon_{i,p.t} \tag{23}$$

$F_t[I_{i,t+h}]$ is firm i's investment plan for a given year $t+h$ made in quarter t. $Upturn_t$ takes a value of 1 if the Chicago Fed National Activity Index increased relative to the previous quarter. $Crisis_t$ takes a value of 1 if date t lies within 2007Q4-2009Q2 or 2020Q1-2020Q3.

Table 4: Response of Investment Plans to Monetary Policy

	LHS: $\tilde{\Delta}F_{i,t}[I_{i,t+h}]$/Assets				
	(1) RHS: BS MPS	(2) RHS: 2y UST Shocks	(3) RHS: 5y UST Shocks	(4) RHS: 10y UST Shocks	(5) RHS: 2-10y UST Shocks
MPS	-0.508	0.857*	0.877*	1.365**	0.623
	(0.395)	(0.503)	(0.492)	(0.635)	(0.640)
Over 1yr plan×MPS	-0.503	-2.108**	-2.493***	-2.966***	-0.704
	(0.681)	(0.848)	(0.700)	(1.066)	(1.172)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Observations	65985	65985	65985	65985	65985
R-squared	0.273	0.273	0.273	0.274	0.273

Note: This table reports regressions of planned changes in capital expenditure on MPS over the prior fiscal quarter. We include dummy variables for investment plans that extend 12 or more months ahead; the excluded category consists of plans for the subsequent fiscal year, conditional on the projected year ending at least three months after the plan announcement. Planned capital expenditure change is computed relative to the realized capital expenditure of four quarters ending one fiscal quarter before the announcement, normalized for inflation and divided by the rolling sum of the real assets over the prior 4 quarters ($t-4$ to $t-1$). Column (1) uses the ST shock. Columns (2)-(5) use the high-frequency change in the 2-, 5-, and 10-year UST yield. The monetary-policy event window measures are constructed by summing 2-day shocks into a 90-day rolling window up to the quarter end prior to the announcement. The regressions also control for quarterly firm-level characteristics, including lagged size (ln(Assets)), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash-to-assets, and Tobin's Q. Macro controls include the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, as well as the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$. Four lags of GDP growth, the inflation rate, and the unemployment rate are also included. Firm fixed effects are included, and standard errors are clustered at both the firm and time levels. The outcome variable is trimmed at the 2nd and 98th percentiles.

Table 5: Planned Investment Response to Monetary Policy by Horizon

	LHS: $\tilde{\Delta}F_{i,t}[I_{i,t+h}]$/Assets				
	(1) RHS: BS MPS	(2) RHS: 2y UST Shocks	(3) RHS: 5y UST Shocks	(4) RHS: 10y UST Shocks	(5) RHS: 2-10y UST Shocks
MPS	-0.791*	0.700	0.703	1.223**	0.702
	(0.466)	(0.485)	(0.481)	(0.609)	(0.643)
Projection horizon (yrs)=2×MPS	0.791	-1.225	-1.295**	-1.367	-0.0199
	(0.840)	(0.740)	(0.645)	(0.927)	(1.215)
Projection horizon (yrs)=3×MPS	0.935	-2.633*	-2.252*	-2.561	1.755
	(1.201)	(1.330)	(1.321)	(1.634)	(2.133)
Projection horizon (yrs)=4×MPS	1.587	-3.821**	-4.777***	-5.817**	-0.798
	(2.065)	(1.826)	(1.773)	(2.454)	(3.515)
Projection horizon (yrs)=5×MPS	2.348	-2.663	-3.412**	-5.138***	-2.196
	(2.051)	(1.750)	(1.633)	(1.909)	(3.903)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Projection horizon FE	Yes	Yes	Yes	Yes	Yes
Observations	65985	65985	65985	65985	65985
R-squared	0.273	0.273	0.273	0.273	0.273

Note: This table reports OLS regressions of planned capital expenditure growth on MPS over the prior fiscal quarter. We include dummy variables for investment plans extending 2, 3, 4, and ≥ 5 years ahead; the excluded category consists of plans for the subsequent fiscal year, conditional on the projected year ending at least three months after the plan announcement. Planned capital expenditure change is computed relative to the realized capital expenditure of four quarters ending one (two) fiscal quarter before the announcement, normalized for inflation and divided by the rolling sum of the real assets over the prior 4 quarters ($t-4$ to $t-1$). Column (1) uses the short-term shock. Columns (2)-(5) use the high-frequency change in the 2-, 5-, and 10-year UST yield. The monetary-policy event window measures are constructed by summing 2-day shocks into a 90-day rolling window up to the quarter end prior to the announcement. The regressions also control for quarterly firm-level characteristics, including lagged size (ln(Assets)), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash-to-assets, and Tobin's Q. Macro controls include the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, as well as the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$. Four lags of GDP growth, the inflation rate, and the unemployment rate are also included. Firm fixed effects and projection horizon fixed effects are included, and standard errors are clustered at both the firm and time levels. The outcome variable is trimmed at the 2nd and 98th percentiles.

Table 6: Relationship between Investment Plans and Monetary Policy

(a) Bauer-Swanson Shocks

	All			New Plans	Revised	Interacted	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets
Pure MPS	-0.425**	-2.256***	-1.748**	-2.408**	-1.416	-1.086	-1.133
	(0.213)	(0.331)	(0.865)	(0.929)	(0.898)	(0.884)	(1.066)
Neg shock=1 × Pure MPS		5.007***	2.842*	1.884	2.986*	2.437	1.605
		(0.695)	(1.622)	(1.874)	(1.700)	(1.728)	(3.253)
New plans=1 × Pure MPS						-1.549*	-3.471**
						(0.865)	(1.662)
Neg shock=1 × New plans=1 × Pure MPS						0.0277	2.923
						(1.942)	(5.299)
New plans						0.165***	0.321**
						(0.0606)	(0.138)
Macro Controls			✓	✓	✓	✓	✓
Firm Controls			✓	✓	✓	✓	✓
Projection horizon FE			✓	✓	✓	✓	✓
Firm FE			✓	✓	✓	✓	✓
Horizons	All	All	All	All	All	All	>12m
Observations	74580	74580	65985	22364	43097	65985	12391
R-squared	0.0000586	0.000846	0.273	0.307	0.285	0.274	0.377

(b) UST 2-year Shocks

	All			New Plans	Revised	Interacted	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets	$\tilde{\Delta}$ F[Capex]/assets
Shock 2y	1.996***	-1.915***	-0.931	-0.944	-0.795	-0.504	-3.494**
	(0.190)	(0.397)	(0.875)	(1.363)	(0.902)	(0.917)	(1.717)
Neg shock=1 × Shock 2y		6.431***	2.338	1.758	2.231	1.693	2.414
		(0.598)	(1.419)	(2.010)	(1.411)	(1.461)	(2.635)
New plans=1 × Shock 2y						-0.916	-0.292
						(1.431)	(3.217)
Neg shock=1 × New plans=1 × Shock 2y						1.299	0.661
						(2.012)	(4.701)
New plans						0.159***	0.235*
						(0.0605)	(0.138)
Macro Controls			✓	✓	✓	✓	✓
Firm Controls			✓	✓	✓	✓	✓
Projection horizon FE			✓	✓	✓	✓	✓
Firm FE			✓	✓	✓	✓	✓
Horizons	All	All	All	All	All	All	>12m
Observations	74580	74580	65985	22364	43097	65985	12391
R-squared	0.00149	0.00303	0.273	0.306	0.285	0.273	0.377

Notes: This shows results for the following specification:

$$\tilde{\Delta}F_{i,t}[I_{i,t+h}]/Assets_{i,t-1} = \beta_1 MPS_t + \beta_2 MPS_t \times \mathbb{1}\{MPS_t \leq 0\} + \gamma X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t} \tag{24}$$

where $\tilde{\Delta}F_{it}[I_{i,t+h}]/Assets_{i,t-1}$ is planned real investment for firm i in future period $t+h$ relative to the rolling sum of the real investment over the prior 4 quarters ($t-4$ to $t-1$), divided by time $t-1$ assets. $NegShock$ is an indicator equal to 1 if $MPS \leq 0$ and 0 otherwise. "New Plans" is a dummy variable that equals one if it is the first time the firm discloses investment plans in the year $t+h$. The last column includes only plans that are for projection periods that end more than 12 months after the plan announcement. $X_{i,t}$ include firm controls (size (log Assets), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash-to-assets, and Tobin's Q), macro controls (four lags of the unemployment rate, delta log GDP, and CPI, changes in CFNAI in the $t-1$ quarter, the level of the CFNAI in the $t-1$ quarter, the two-year yield level $2y_t$ and the yield curve slope $10-2y_t$). Standard errors are clustered at the firm and fiscal quarter level. The outcome variable is trimmed at the 2nd and 98th percentiles; all firm controls are winsorized at 1% and 99%.

Table 7: Relationship between Cost of Debt and Monetary Policy Shocks

	Change in rD							
	(1) All	(2) All	(3) All	(4) Size	(5) Leverage	(6) Tangibility	(7) Int Exp / Debt	(8) Profitability
MPS	1.442***	1.425***	1.032**	0.493	0.757*	1.062***	0.916**	1.127**
	(0.0951)	(0.502)	(0.412)	(0.304)	(0.397)	(0.384)	(0.413)	(0.438)
Top × MPS				1.041*	0.648***	-0.0662	0.386	-0.303
				(0.580)	(0.233)	(0.312)	(0.362)	(0.269)
Top				-0.0163	-0.0125	0.0206	-0.00529	0.0177
				(0.0321)	(0.0253)	(0.0337)	(0.0212)	(0.0211)
Firm Controls			✓	✓	✓	✓	✓	✓
Macro Controls			✓	✓	✓	✓	✓	✓
Firm FE		✓	✓	✓	✓	✓	✓	✓
R-squared	0.007	0.045	0.078	0.079	0.078	0.078	0.078	0.078
N	34,676	34,572	30,818	30,818	30,818	30,818	30,818	30,818

Notes: This shows results for the following specification:

$$\Delta^{MP} r^D_{i,t} = \beta_1 MPS_t + \beta_2 MPS_t \times \mathbb{1}\{\text{Top Tercile}\} + \beta_3 \mathbb{1}\{\text{Top Tercile}\} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t} \tag{25}$$

where $\Delta^{MP} r^D_{it}$ is the change in a firm's cost of debt around monetary policy events in quarter t, and MPS_t is the sum of monetary policy shocks in quarter t. $X_{i,t-1}$ include firm controls (size (ln Assets), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash-to-assets, and Tobin's Q) and macro controls (the level of and quarterly change in CFNAI, the two-year yield level $2y_t$ and the yield curve slope $10-2y_t$, and four lags of GDP growth, unemployment rate, and inflation rate). Standard errors are clustered at the firm and time level.

Table 8: Relationship between Investment Plans and Cost of Debt Shocks

	$\tilde{\Delta}F_{i,t}[I_{i,t+h}]$/Assets							
	(1) All	(2) All	(3) All	(4) Size	(5) Leverage	(6) Tangibility	(7) Int Exp / Debt	(8) Profitability
Change in rD	0.0186	-0.198***	-0.181***	-0.0972	-0.160**	-0.00807	-0.135**	-0.220***
	(0.0167)	(0.0278)	(0.0499)	(0.0983)	(0.0621)	(0.0378)	(0.0565)	(0.0542)
Exp change × Change in rD		0.407***	0.292***	0.164	0.302***	-0.0181	0.183**	0.378***
		(0.0426)	(0.0726)	(0.135)	(0.0951)	(0.0758)	(0.0891)	(0.0806)
Top × Change in rD				-0.111	-0.0467	-0.335***	-0.165*	0.147*
				(0.102)	(0.0745)	(0.0838)	(0.0888)	(0.0883)
Exp change × Top × Change in rD				0.173	-0.0111	0.602***	0.372***	-0.338**
				(0.144)	(0.127)	(0.143)	(0.137)	(0.128)
Top				0.0497	-0.423***	0.182	0.278***	-0.0167
				(0.134)	(0.123)	(0.154)	(0.0778)	(0.0732)
Firm Controls			✓	✓	✓	✓	✓	✓
Macro Controls			✓	✓	✓	✓	✓	✓
Projection horizon FE			✓	✓	✓	✓	✓	✓
Firm FE			✓	✓	✓	✓	✓	✓
R-squared	0.000	0.002	0.250	0.251	0.252	0.251	0.251	0.251
N	41,224	41,224	36,370	36,370	36,370	36,370	36,370	36,370

Notes: This shows results for the following specification:

$$\begin{aligned}\tilde{\Delta}F_{i,t}[I_{i,t+h}] = \beta_1 \Delta^{MP} r^D_{it} + \beta_2 \Delta^{MP} r^D_{it} \times \mathbb{1}\{\Delta^{MP} r^D_{it} \leq 0\} + \beta_3 \Delta^{MP} r^D_{it} \times \mathbb{1}\{\text{Top Tercile}\} \\ + \beta_4 \Delta^{MP} r^D_{it} \times \mathbb{1}\{\text{Top Tercile}\} \times \mathbb{1}\{\Delta^{MP} r^D_{it} \leq 0\} + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t}\end{aligned} \tag{26}$$

where $\tilde{\Delta}F_{i,t}[I_{i,t+h}]$ is real planned investment growth for firm i in future period p, projected in quarter t. $MPS^{r^D}_t$ is the change in a firm's cost of debt around monetary policy events in quarter t. The top tercile dummy is included for columns (4)-(8) and indicates whether a firm belongs to the top tercile for the relevant characteristic. The characteristics are size (ln Assets), leverage (Total Debt/Assets), tangibility (PPE/Assets), interest expense to debt (Interest Expense/Total Debt), and profitability (NI/Assets). $X_{i,t-1}$ include firm controls (lagged size (ln Assets), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash to assets, and Tobins's Q) and macro controls (the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$, and four lags of GDP growth, inflation rate, and unemployment rate). Standard errors are clustered at the firm and time level. Firm fixed effects and projection horizon fixed effects are included. $\tilde{\Delta}F_{i,t}[I_{i,t+h}]$ is trimmed at the 2% and 98% level.

Table 9: Relationship between Investment Plans and Projected Cash Flows

	$\tilde{\Delta}F_{i,t}[I_{i,t+h}]$/Assets						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	All	Size	Leverage	Tangibility	Int Exp / Debt	Profitability
$\tilde{\Delta}F_{i,t}[CF_{i,t+h}]$/Assets	0.00440	0.00385*	0.00561**	0.00508**	0.00383	0.00462**	0.00112
	(0.00292)	(0.00201)	(0.00248)	(0.00239)	(0.00251)	(0.00185)	(0.00303)
Top $\times$ $\tilde{\Delta}F_{i,t}[CF_{i,t+h}]$/Assets			-0.00649*	-0.0114	0.0000546	-0.00375	0.00385
			(0.00330)	(0.00817)	(0.00673)	(0.00502)	(0.00351)
Top			0.187	-0.230	-0.173	0.102	-0.0208
			(0.208)	(0.170)	(0.335)	(0.126)	(0.0973)
Firm Controls		✓	✓	✓	✓	✓	✓
Macro Controls		✓	✓	✓	✓	✓	✓
Projection horizon FE		✓	✓	✓	✓	✓	✓
Firm FE		✓	✓	✓	✓	✓	✓
Time FE		✓	✓	✓	✓	✓	✓
R-squared	0.001	0.369	0.369	0.370	0.369	0.369	0.369
N	9,048	8,135	8,135	8,135	8,135	8,135	8,135

Notes: This shows results for the following specification:

$$\tilde{\Delta}F_{i,t}[I_{i,t+h}]/A_{i,t-1} = \beta_1 \tilde{\Delta}F_{i,t}[CF_{i,t+h}] + \beta_2 \tilde{\Delta}F_{i,t}[CF_{i,t+h}] \times \mathbb{1}\{\text{Top Tercile}\} + \beta_3 \mathbb{1}\{\text{Top Tercile}\} + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t} \quad (27)$$

where $\tilde{\Delta}F_{i,t}[I_{i,t+h}]/A_{i,t-1}$ is planned real CAPX for firm i in future period $t+h$ relative to real realized CAPX today at time t, divided by assets, and $\tilde{\Delta}F_{i,t}[CF_{I,t+h}]$ is the analogous measure for planned net income. The top tercile dummy is included for columns (4)-(8) and indicates whether a firm belongs to the top tercile for the relevant characteristic. The firm characteristics are size (ln Assets), leverage (Total Debt/Assets), tangibility (PPE/Assets), interest expense to debt (Interest Expense/Total Debt), and profitability (NI/Assets). $X_{i,t-1}$ include firm controls and macro controls. Firm fixed effects and projection horizon fixed effects are included. $\tilde{\Delta}F_{i,t}[CF_{i,t+h}]$ is winsorized at the 1% and 99% level. Standard errors are clustered at the firm and time level.

Table 10: Relationship between Cash Flow Expectations and Monetary Policy

	Normalized Expected Net Income, wins								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	All	All	Size	Leverage	Tangibility	Int Exp / Debt	Profitability	Asset Sp
Shock 2y	-0.130	-14.47**	-12.42**	-22.16***	-14.95***	-8.049	-18.74***	-10.79*	-6.828
	(2.486)	(6.180)	(4.824)	(7.712)	(4.915)	(5.086)	(5.371)	(6.315)	(8.478)
Exp shock × Shock 2y		21.60**	16.13*	26.53**	20.55**	6.902	25.31**	16.01	8.743
		(8.606)	(8.850)	(13.08)	(8.573)	(8.705)	(10.15)	(10.78)	(14.16)
Top × Shock 2y				23.30**	9.468	-16.11	33.85**	-2.774	-9.731
				(10.85)	(11.49)	(14.46)	(16.01)	(10.34)	(11.90)
Exp shock × Top × Shock 2y				-24.63	-16.49	34.50	-50.04**	-0.726	12.88
				(17.25)	(17.37)	(21.63)	(23.88)	(14.95)	(18.01)
Top				-0.169	-0.651	0.773	-0.871	0.520	-0.262
				(0.861)	(0.750)	(1.810)	(0.683)	(0.630)	(2.043)
Firm Controls			✓	✓	✓	✓	✓	✓	✓
Macro Controls			✓	✓	✓	✓	✓	✓	✓
Projection horizon FE			✓	✓	✓	✓	✓	✓	✓
Firm FE			✓	✓	✓	✓	✓	✓	✓
R-squared	0.000	0.001	0.346	0.347	0.347	0.347	0.347	0.347	0.346
N	9,086	9,086	8,162	8,162	8,162	8,162	8,162	8,162	8,162

Notes: This shows results for the following specification:

$$\begin{aligned}\tilde{\Delta}F_{i,t}[CF_{i,t+h}] = \beta_1 MPS_t + \beta_2 MPS_t \times \mathbb{1}\{MPS_t \leq 0\} + \beta_3 MPS_t \times \mathbb{1}\{\text{Top Tercile}\} \\ + \beta_4 MPS_t \times \mathbb{1}\{\text{Top Tercile}\} \times \mathbb{1}\{MPS_t \leq 0\} + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{iht}\end{aligned} \tag{28}$$

where $\tilde{\Delta}F_{i,t}[CF_{i,t+h}]$ is real planned net income for firm i in future period $t+h$, projected in quarter t, relative to realized net income in t, scaled by assets. MPS_t is the sum of monetary policy shocks occurring in quarter t. The top tercile dummy is included for columns (4)-(8) and indicates whether a firm belongs to the top tercile for the relevant characteristic. The firm characteristics are size (ln Assets), leverage (Total Debt/Assets), tangibility (PPE/Assets), interest expense to debt (Interest Expense/Total Debt), and profitability (NI/Assets). $X_{i,t-1}$ include firm controls (lagged size (ln Assets), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash to assets, and Tobins's Q). The macro controls are the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$, and four lags of GDP growth, inflation rate, and unemployment rate. Standard errors are clustered at the firm and time level. Firm fixed effects and projection horizon fixed effects are included. $\tilde{\Delta}F_{i,t}[CF_{i,t+h}]$ is winsorized at the 1% and 99% level.

Table 11: Heterogeneity in Planned Real Capex Growth over Asset Response to 5y inflation

	(1) All	(2) All	(3) All	(4) Size	(5) Leverage	(6) Tangibility	(7) Int Exp / Debt	(8) Profitability
Shock 5y infl	-1.864***	-1.836***	-1.282***	-1.506***	-1.314***	-0.740***	-1.322***	-1.153***
	(0.110)	(0.342)	(0.195)	(0.214)	(0.214)	(0.212)	(0.193)	(0.249)
Neg change × Shock 5y infl	3.887***	4.200***	2.096**	2.573**	1.812*	0.963	2.382**	1.524
	(0.287)	(1.118)	(0.942)	(1.001)	(0.927)	(0.710)	(1.032)	(0.975)
Top × Shock 5y infl				0.619***	0.161	-1.326***	0.147	-0.389
				(0.211)	(0.180)	(0.371)	(0.343)	(0.274)
Neg change × Top × Shock 5y infl				-1.275*	0.765	2.708*	-1.008	1.800**
				(0.760)	(0.609)	(1.384)	(0.836)	(0.747)
Top				-0.230*	-0.312***	0.0464	0.0987	0.123**
				(0.121)	(0.111)	(0.124)	(0.0620)	(0.0566)
Firm Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Macro Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Projection horizon FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.004	0.258	0.274	0.274	0.275	0.275	0.275	0.274
N	74,580	74,084	65,985	65,985	65,985	65,985	65,985	65,985

Notes: This table reports estimates from the following specification:

$$\begin{aligned}\tilde{\Delta}F_{i,t}[I_{i,t+h}] = {} & \beta_1 \Delta^{MP}\pi^e_{5y,t} + \beta_2 \left(\Delta^{MP}\pi^e_{5y,t} \times \mathbb{1}\{\Delta^{MP}\pi^e_{5y,t} \leq 0\}\right) \\ & + \beta_3 \left(\Delta^{MP}\pi^e_{5y,t} \times \mathbb{1}\{\text{Top Tercile}\}\right) + \beta_4 \left(\Delta^{MP}\pi^e_{5y,t} \times \mathbb{1}\{\text{Top Tercile}\} \times \mathbb{1}\{\Delta^{MP}\pi^e_{5y,t} \leq 0\}\right) \\ & + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,h,t},\end{aligned} \tag{29}$$

where $\tilde{\Delta}F_{i,t}[I_{i,t+h}]$ is firm-i's planned real capex growth for horizon h (normalized by $A_{i,t-1}$), and $\Delta^{MP}\pi^e_{5y,t}$ is the surprise in five-year expected inflation around monetary policy announcements. Columns (4)–(8) include a "Top Tercile" indicator for firms in the top tercile of each characteristic—size (ln Assets), leverage (Debt/Assets), tangibility (PPE/Assets), interest-expense/debt, or profitability (NI/Assets). $X_{i,t-1}$ comprises lagged firm controls (size, leverage, ROA, tangibility, cash/assets, Tobin's Q) and macro controls (CFNAI level and change, two-year yield, term slope, and four lags of GDP growth, inflation, and unemployment). All fixed effects (α_i, α_h) are included, and both $\tilde{\Delta}F_{i,t}[I_{i,t+h}]$ and $\Delta^{MP}\pi^e_{5y,t}$ are winsorized at the 2nd and 98th percentiles. Standard errors are clustered by firm and horizon.

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A Why Use Data on Plans?

Estimating the causal effects of monetary policy on firm-level investment poses significant econometric challenges. In this section, we show that using revisions of company investment plans, rather than data on ex-post realized investment, greatly mitigates these concerns. The conventional empirical approach employs local-projection impulse-response functions (IRFs), regressing realized capital growth (e.g., $\Delta \ln K_{i,t+h}$) on monetary policy shocks (MPS) at time t. However, IRFs constructed from realized investment data can suffer from three problems: bias and estimation noise due to omitted variables, multiple intervening shocks, and firms' time-to-build lags, all of which may be exacerbated at longer horizons.

Consider the common regression equation to estimate β_h^R, the impact of monetary policy on horizon h investment, denoted R because it is estimated using data on realized investment:

$$\Delta \ln K_{i,t+h} = \beta_h^R \mathrm{MPS}_t + X_{i,t-1} + \nu_{i,t+h}^R \tag{30}$$

A substantial literature has already attempted to overcome the potential omitted variable bias in the estimator $\hat{\beta}_h^R$ by improving the exogeneity of the monetary policy shocks on the right-hand side of the equation. For example, unobserved demand shocks or trends may simultaneously raise realized investment and prompt the central bank to tighten monetary policy. Such correlation biases the coefficient towards zero, understating the contractionary effect of tighter monetary conditions. Conversely, unobserved input-price or overheating shocks could simultaneously decrease realized investment and prompt monetary tightening, thus biasing the IRF downward, overstating the contractionary effects. These potential biases put significant pressure on the exogeneity of the monetary policy shocks, though recent papers have made substantial progress on this front (see, e.g., Romer and Romer [2004], Gurkaynak et al. [2005], Kuttner [2001], Nakamura and Steinsson [2018], Jarociński and Karadi [2020], Bauer and Swanson [2023]).

Even if the monetary policy shocks are truly exogenous, two important issues remain, as illustrated in the following equation:

$$\Delta \ln K_{i,t+h} = \beta_h^R \,\mathrm{MPS}_t + X_{i,t-1} + \sum_{s=1}^{h} \psi_{h,s}\, u_{t+s} + \sum_{s=1}^{\tau_{it}} \phi_{h,s} v_{t-s} + \eta_{i,t+h}^R \tag{31}$$

First, realized investment observed at time $t+h$ may respond not only to the original monetary shock at time t, but also to additional shocks occurring between t and $t+h$, where u_{t+s} represent any intervening

demand shocks, cost shocks, or additional policy shocks. If these shocks are correlated with the initial shock, this creates additional bias. Even when $Cov\left(u_{t+s}, \text{MPS}_t\right) = 0 \; \forall s$, the cumulative variance of u_{t+s} increases the residual of the regression and thus the noise of the estimator.

Second, unknown planning and time-to-build lags τ_{it} imply that even a purely exogenous monetary shock at t generates systematically attenuated responses at shorter horizons. Thus, investment in time $t+h$ could reflect shocks v that occurred in time $t-s$, via long time-to-build lags. Consider a firm that in time $t-1$ began building a nuclear plant which has 10 years' time to build, and has plans to begin building a solar energy farm in time $t+1$. Given a large contractionary shock in time t, it is unlikely to change course and stop building the first plant; however, it may scale down plans for the solar project it had intended to begin building in time $t+1$. Using only realized data, the econometrician would miss the reduction in investment in the solar plant, thus underestimate the impact of the shock.

Using forward-looking investment plans alleviates all three problems. We define revisions as changes in a given firm's investment plan about a specific projection year:[8]

$$Revision_{i,t,h} = \frac{F_{i,t}\left[I_{i,t+h}\right] - F_{i,t-1}\left[I_{i,t+h}\right]}{K_{i,t-1}}. \tag{32}$$

This explicitly isolates firms' contemporaneous responses to new information at time t. By construction, revisions to investment plans are unaffected by previously known demand shocks or trends at time $t-1$, since firms already incorporate these into prior expectations; this substantially reduces omitted variable bias arising from an imperfectly exogenous monetary policy shock, leaving only a minor residual bias from other variables evolving within the quarter from $t-1$ to t. Secondly, intervening shocks that occur between time t and $t+h$ are by construction excluded from the measure, reducing the noise of the estimator. Finally, since plan revisions are measured precisely when firms adjust their expectations rather than when investment is physically realized, they do not suffer from the mechanical attenuation caused by unknown construction lags.

Our baseline regression is therefore:

$$Revision_{i,t,h} = \beta_h^P \, \text{MPS}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}, \tag{33}$$

[8]This normalized forecast difference, $\frac{\Delta F_{i,t}\left[I_{i,t+1}\right]}{K_{i,t-1}}$, maps (up to the first order) to the log-change in capital $\Delta \ln K_{i,t}$ used as the left-hand-side variable in standard empirical tests of investment response to monetary policy in the literature (e.g. Ottonello and Winberry [2020], Crouzet [2021]).

where MPS_t is the monetary policy shock, $X_{i,t-1}$ are lagged firm- and macro-level controls, and α_i are firm fixed effects. Firm controls include cash-to-assets, leverage, log assets, return on assets, tangibility and Tobin's Q. Macro controls include the quarterly change in the Chicago Fed National Activity Index (CFNAI) as well as its level, the 2- year U.S. Treasury yield level, the 2-to-10 year U.S. Treasury yield slope, and four lags of GDP growth, inflation rate, and unemployment rate. Coefficient β measures the change in planned investment per dollar of capital in response to monetary policy shocks.

In practice, some firms do not issue updated forecasts in consecutive periods. For those observations, we replace the missing prior forecast $F_{i,t-1}[I_{i,t+1}]/K_{i,t-1}$ with the last observed realization $I_{i,t-1}/K_{i,t-1}$. We denote these adjusted revisions as $\tilde{\Delta}F_{i,t}[I_{i,t+1}]/K_{i,t-1}$. This substitution rests on a simple assumption: in the absence of a new plan, the firm's own most recent investment serves as the best unbiased predictor of its planned future investment. Crucially, the key advantages of using investment plans–explicitly isolating responses to monetary policy shocks at time t, unaffected by future intervening shocks occurring between t and realization at $t+h$, and addressing potential time-to-build concerns–remain fully preserved under this substitution.

To empirically evaluate this assumption, we perform a series of tests on projected and realized investment. Figure C.1 shows a strong positive relationship between prior-period investment and prior-period planned investment. Table C.1 shows the results of more tests, which are discussed in Appendix A.1. These results collectively validate the assumption that prior-period investment serves as a reasonable proxy for missing prior-period investment plans, preserving our ability to explicitly isolate firm responses to contemporaneous monetary policy shocks while allowing us to use a larger portion of the data.

Despite the benefits of the plans data, we still face a tradeoff: only a subset of firms for which we observe realized investment disclose planned investment. While plans data benefit from potentially lower bias and variance, they are typically reported by a smaller subset of firms which could increase noise. If the total number of firms in the realized investment dataset is N_R, and only $N_P = rN_R$ firms report plans, the empirical variance terms of the coefficient from Equations 31 and 8 can be written, respectively:

$$\text{var}(\widehat{\beta}_h^R \mid X) = \frac{\sigma_R^2}{N_R V (1-R^2)}, \qquad \text{var}(\widehat{\beta}_h^P \mid X) = \frac{\sigma_P^2}{N_P V (1-R^2)}. \tag{34}$$

where $V = \text{var}(\text{MPS}_t), R^2 = R^2_{\text{MPS}|X}$, and $\sigma_R^2 \equiv \text{var}(\eta^R) = \sum_{s=1}^{h} \psi_{h,s}^2 \sigma_u^2 + \sigma_\nu^2$ is the variance of aggregate shocks between t and $t+h$. As the projection horizon h lengthens, the variance from intervening shocks

accumulates, worsening the signal-to-noise ratio of the estimate. Note that the intervening shocks could also create additional bias in the realized estimate if the MPS are serially correlated.

To evaluate clearly whether forward-looking plans improve the empirical IRF estimation, we compare the mean-squared errors (MSE) of the two estimators. Denote the bias in the realizations regression 31 as $\text{Bias}_R = \mathbb{E}[\widehat{\beta}_h^R] - \beta_h^R$. Then we can define:

$$\text{MSE}_R = \text{B}ias_R^2 + \text{var}\big(\widehat{\beta}_h^R\big), \qquad \text{MSE}_P = \text{var}\big(\widehat{\beta}_h^P\big). \tag{35}$$

The plans-based estimator dominates if and only if:

$$\text{MSE}_P < \text{MSE}_R \quad \Longleftrightarrow \quad r > \frac{\sigma_P^2}{\sigma_R^2 + N_R\, V\,(1-R^2)\,(\text{Bias}_R^2)}. \tag{36}$$

This defines the upper bound on the ratio of observations in the plans data to the realizations data that makes the estimator from plans data more informative than that from the realizations data. The greater the bias in the realized estimator β_h^R, the fewer observations are needed in the plans data to ensure that the plans estimator is superior. Moreover, if we assume that the MPS are truly exogenous, the R^2 term (which represents the share of the MPS variation that is explained by the controls $X_{i,t-1}$) goes to 0.

In practice, we observe N_R and can estimate the variances $\sigma_P^2, \sigma_R^2, V$. We do not have a way of estimating the Bias term directly. To establish reasonable bounds on the bias in typical IRFs estimated using data on realizations, we draw from the existing literature. Bauer and Swanson [2023] find that their improved identified MPS increases the magnitude of the industrial production response to MPS by a factor of four, from a biased estimate of -0.35% to an improved estimate of -1.4%. The methods in Romer and Romer [2004] change the same responsiveness from a biased estimate of -2.4% to -4.3% in response to 100 basis increase in the Fed Funds Rate. These are large biases that range from 50% to 400%, providing an upper bound for the bias at around four times our coefficient estimate. A reasonable lower bound is 0.

We then plot the minimum r, or ratio of plans data to realizations data, required for the plans estimator to be more useful than the realizations estimator. Figure C.8 plots, for two horizons $h = 1$ and $h = 5$, the minimum fraction of firms $r = \frac{N_P}{N_R}$ required for the plan revisions-based estimator to dominate the realized-data estimator as a function of an assumed upper bound bias term. To be conservative, we allow imperfectly exogeneous monetary-policy shocks by using the empirical R^2 term in the regression of the MPS on controls, which is under 9% and raises the threshold slightly relative to a baseline with a perfect

exogeneity assumption. In either case, plans data produces lower MSE estimates for even reasonably low assumed bias. If the realized-estimator bias were 0.5, the threshold indicates that the plans data would need at least one observation per 1,200 observations in the realizations data to improve the $h = 1$ impulse-response estimate; the threshold is even lower for longer horizons and larger biases. These results underscore that even a modest subsample of forward-looking plans suffices to outperform realized investments, even for medium and long horizons, given the improvement in the signal to noise ratio relative to using solely realizations data.

In summary, we find that for reasonable levels of bias, we have more than sufficient plans data in the universe of U.S. non-financial corporations in Compustat for the plans-based estimator in Equation 8 to perform better than the realizations-based estimator in Equation 31. Importantly for our purposes, the improved precision arising from removing the noise of intermittent shocks between a monetary policy shock and investment realization allows us to better pinpoint heterogeneity in responses and mechanisms.

Firms may self-select into reporting future capital expenditure plans in a way that correlates with unobserved determinants of investment, potentially biasing our estimated policy effects. We test if firms selectively disclose investment plans or cash flow expectations in Table C.3, and find no clear difference in investment opportunities (as measured by Tobin's Q) or profitability in quarters when firms disclose investment plans within firm, suggesting it is unlikely firms are trying to mislead investors given poor performance. However, firms tend to have higher investment rates, more leverage and less cash on hand when they disclose plans, suggesting they may be more likely to disclose when they are preparing to raise capital for investment. That being said, the median firm in our sample reports investment plans 44 quarters over the full sample, allowing sufficient within-firm variation for our analysis.

A.1 Is Lagged Investment is a Reasonable Proxy for Prior Planned Investment?

We perform a series of tests on projected and realized investment to verify the assumption that in the absence of a new plan, the firm's own most recent investment serves as the best unbiased predictor of its planned future investment. The results are shown in Table C.1. Columns (1) and (2) demonstrate a strong correlation between lagged investment and the lagged investment plan, robust to firm fixed effects. Column (3) indicates no significant correlation between the residual "news" (the component of the prior-period plan unexplained by lagged investment and controls, recovered from the residual in Column (2)) and MPS, validating the substitution's robustness for our particular purposes. Columns (4) and (5) show that lagged investment alone

explains nearly 90 percent of the variation in future investment, and the predictive power of the actual plan is similar to that for lagged plans. Columns (6) and (7) confirms that there is no systematic selection bias in issuing updated forecasts: we regress future actual investment on lagged investment interacted with a dummy for whether a plan is available, and find no significance in the interacted term. These results collectively validate the assumption that prior-period investment serves as a reasonable proxy for missing prior-period investment plans.

B Data Collection and Cleaning

We provide standardized instructions for our research assistants on how to collect the data. We created a protocol by first asking two MIT undergraduates to look through the websites and filings of publicly traded companies to identify the location of the data. Through this experience, we created a video and document with step-by-step instructions on how to collect this data that we shared with all subsequent research assistants. The instructions are below.

Goal

We are interested in every plan the company has published in its entire history, and every year that they project capital expenditures (also known as "investment plans", "capital spending", "capital investment plan", "capital program"). The goal is to collect for every company, every quarter, what it plans for investing every year. So each line in the spreadsheet should be a unique company, quarter, and projected plan year.

Instructions

We collect the data from two potential sources: (1) the company's Earnings Call Presentations (available on the Investor Relations portion of their website), and (2) their 10-K or 10-Q filing at the sec.gov.

1. Check if there is anything in their 10-K or 10-Q on the capital expenditure plans. This may be available by searching "Capital plan", "Capital expenditure", "Capital spending plan", etc.
   (a) If so, then enter in the numbers and surrounding text into the file provided.
   (b) If not, then search their earnings call presentations (also called "investor day presentations", "earnings presentations", "earnings announcements", etc).
      i. Google "[Company] Investor Relations"
      ii. Find "Earnings Call Presentations" or "Investor Day Presentations", click
      iii. Click on the presentation PDF
      iv. Search for the term "Capital expenditure" or "capital spending plan" or "Capital plan"
      v. Record the amount (in US billions) and any notes in the spreadsheet
      vi. Repeat for every Earnings Call Presentation that is listed in the company's website.

2. The columns are as follows:

   (a) **Date of transcript**: the date in which the document was published on the website. If there is no date, then put the last date in the quarter that the document refers.

   (b) **Year of projection**: this is the year that the investment plan is for.

   (c) **Source of information**: Include the year, quarter, and name of document. For example, "Q4 2018 News Release", "Q3 2022 Earnings Conference Call Presentation"

   (d) **Investment Plans**: copy and paste the text associated with the investment plan: for example, "Estimates Capex for FY22 will be between $5.5 billion"

   (e) **Estimated Yearly Investment Amount**: Total amount for the year (or remainder of year), in billions of dollars. If the estimated Capex is a range of numbers (eg, 1.1-1.3bn), please report the midpoint (i.e., average). For example, for 1.1-1.3bn, you should report 1.2.

   (f) **Years**: indicates for how many years does the projection include. For example, if the earnings presentation says "3 billion dollars over the next 4 years", then the "years" variable is 4.

   (g) **Total investment amount**: the total amount that is projected. So the columns "Estimated yearly amount" x "Years" should equal "Total Investment Amount". If they publish a range of years, please use the midpoint of the range.

   (h) **Lowpoint of Range**: If the estimated Capex is a range of numbers (eg, 1.1-1.3bn), please report the low point, i.e., 1.1. If there is no range, then set this equal to Estimated Yearly Investment Amount.

   (i) **Highpoint of Range**: If the estimated Capex is a range of numbers (eg, 1.1-1.3bn), please report the high point, i.e., 1.3. If there is no range, then set this equal to Estimated Yearly Investment Amount.

   (j) **Do They Mention an Investment / Capital Expenditure Plan**: this equals 1 if there is a plan, 0 if not.

   (k) **Rest of year projection? 1 if yes, 0 if this is for a full year**: if the plan is for the remainder of the year, then set to 1; if it is for a full year, then set to 0.

   (l) **If available on the 10K or 10Q, what text should we search for to find**: please make sure to add detail if possible so that I do not have to search so many times to find it.

   (m) **If available on the 10K or 10Q, what text should we search for to find**: please make sure to add detail if possible so that I do not have to search so many times to find it.

   (n) **Notes**: If anything was unclear, please mark it here

We have included two examples in the spreadsheet. The highlighted fields are the ones that need to be filled in for each quarter (or year, if the company only reports the data every year). Please let me know if anything is unclear.

B.1 Data Cleaning

One shortcoming of the exercise is that companies that no longer exist due to acquisition or bankruptcy no longer have company earnings call transcripts, investor day presentations available on their websites. As such, our data is a snapshot of all companies that still exist as of the collection of our data, which begins in March 2024 and ends in February 2025.

To determine the period for which the company is intending to project a plan, we use the date of announcement and the company's fiscal year end. We set the projection period end date to be the fiscal year end of the year of the announcement. If the fiscal year ended before the announcement, then we set the projection period end date to the following fiscal year end.[9] For 0.4% of observations, the projection period is only for one quarter, so we fix the projection period end date to the next fiscal quarter end following the date of announcement. Then, we compute the start of the projection period. For those projections that are either for one quarter or the remainder of the fiscal year, we set the start of the projection period to be the start of the fiscal quarter in which the announcement occurs.[10] For all others, we have the project start date as one year prior to the projection end date. We the compute the projection period in months by subtracting the project end date from the project start date.

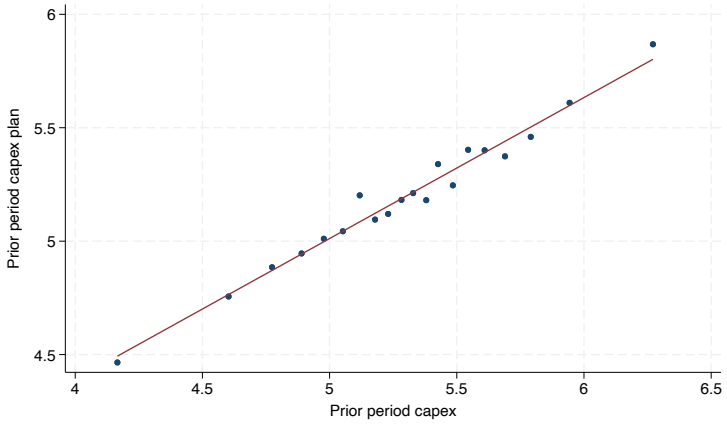
For all of our regressions except for the projection horizon analyses, we exclude those plans that are clearly not for the full capital expenditure for the year. For example, U-Haul Holding Co stated in their 2008Q3 Form 10-Q that "The company has allocated $70.0 million to new acquisitions." Because this is likely a subset of company capex, we exclude this datapoint and the other similar datapoints in analyses that has total planned capital expenditure growth as an outcome variable; this accounts for 2.8% of the total data. We further exclude the 12.9% of observations where the projection horizon is less than one year, for example if a firm projects its next quarter capex.

C Additional Tables and Figures

[9] For example, Albertson's Companies Inc has a fiscal year that ends in February, and on April 28, 2021 it announced that it estimates Capex to be 1.9–2 billion for fiscal year 2021, so we set the projection end period to be February 2022.

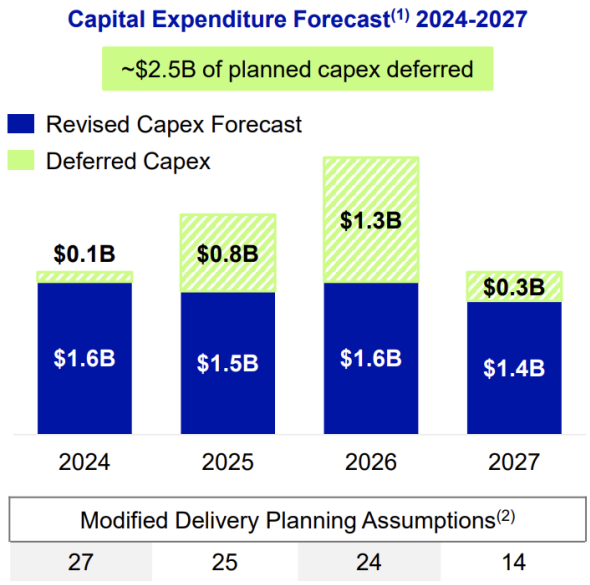
[10] Across all observations, 0.7% are for remainder of the year.

Figure C.1: Binscatter of $\log F_{t-1}$ Against $\log I_{t-1}$.

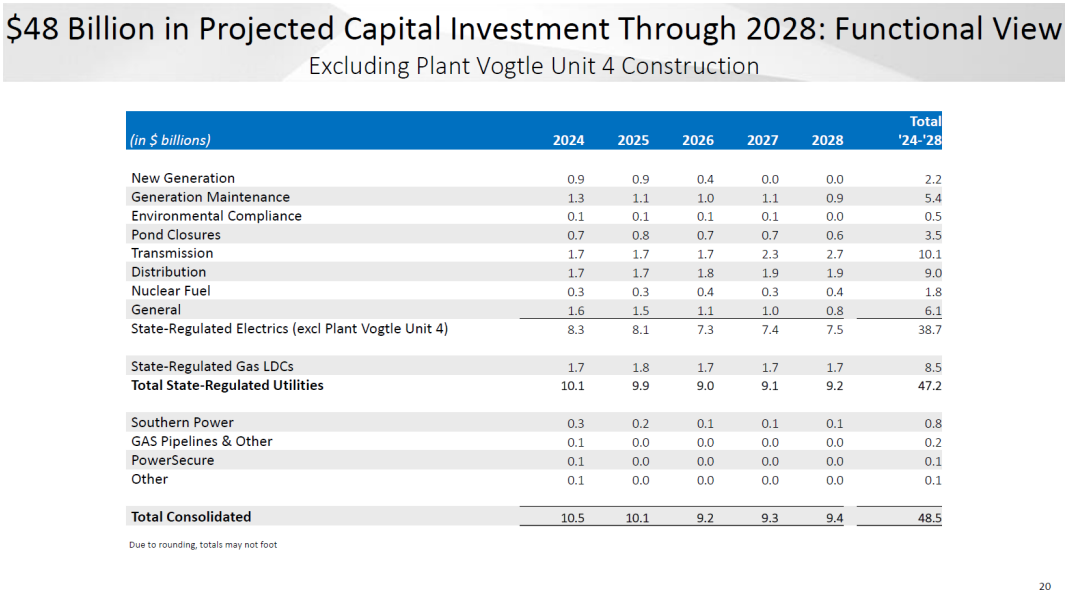


Notes: This figures hows a binned scatter plot of lagged realized investment (on the x-axis) and investment plans (on the y-axis). Includes firm fixed effects.

Figure C.2: Examples of Investment Plan Disclosures



(a) Jetblue 2023 Q4 Earnings presentation



$48 Billion in Projected Capital Investment Through 2028: Functional View

Excluding Plant Vogtle Unit 4 Construction

(in $ billions)	2024	2025	2026	2027	2028	Total '24-'28
New Generation	0.9	0.9	0.4	0.0	0.0	2.2
Generation Maintenance	1.3	1.1	1.0	1.1	0.9	5.4
Environmental Compliance	0.1	0.1	0.1	0.1	0.0	0.5
Pond Closures	0.7	0.8	0.7	0.7	0.6	3.5
Transmission	1.7	1.7	1.7	2.3	2.7	10.1
Distribution	1.7	1.7	1.8	1.9	1.9	9.0
Nuclear Fuel	0.3	0.3	0.4	0.3	0.4	1.8
General	1.6	1.5	1.1	1.0	0.8	6.1
State-Regulated Electrics (excl Plant Vogtle Unit 4)	8.3	8.1	7.3	7.4	7.5	38.7
State-Regulated Gas LDCs	1.7	1.8	1.7	1.7	1.7	8.5
Total State-Regulated Utilities	10.1	9.9	9.0	9.1	9.2	47.2
Southern Power	0.3	0.2	0.1	0.1	0.1	0.8
GAS Pipelines & Other	0.1	0.0	0.0	0.0	0.0	0.2
PowerSecure	0.1	0.0	0.0	0.0	0.0	0.1
Other	0.1	0.0	0.0	0.0	0.0	0.1
Total Consolidated	10.5	10.1	9.2	9.3	9.4	48.5

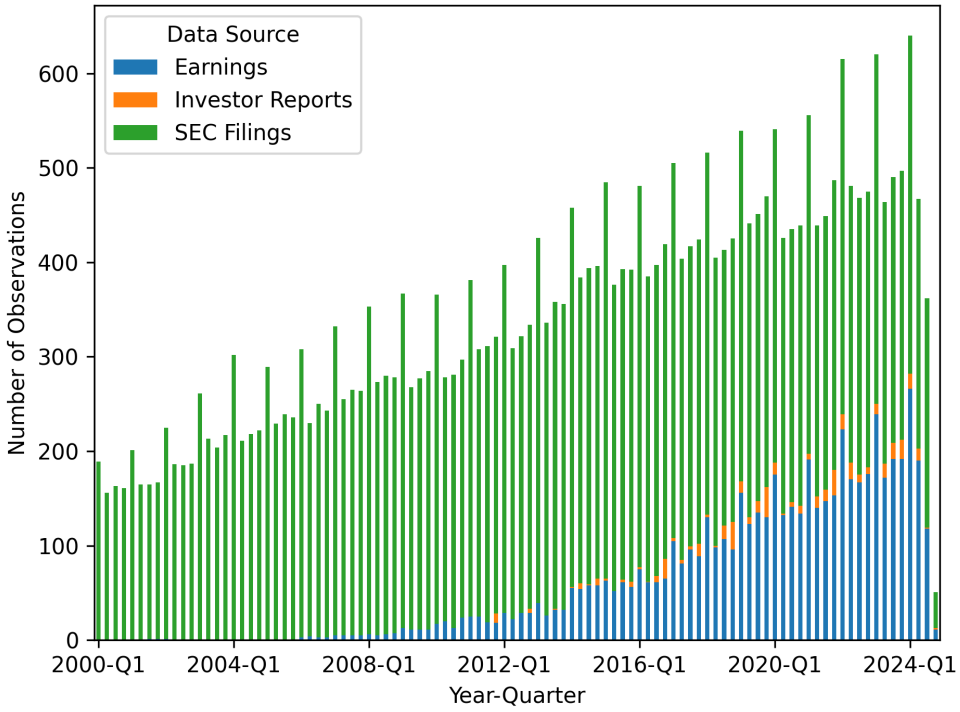
Due to rounding, totals may not foot

20

(b) Southern Company's 2023Q4 Earnings Call

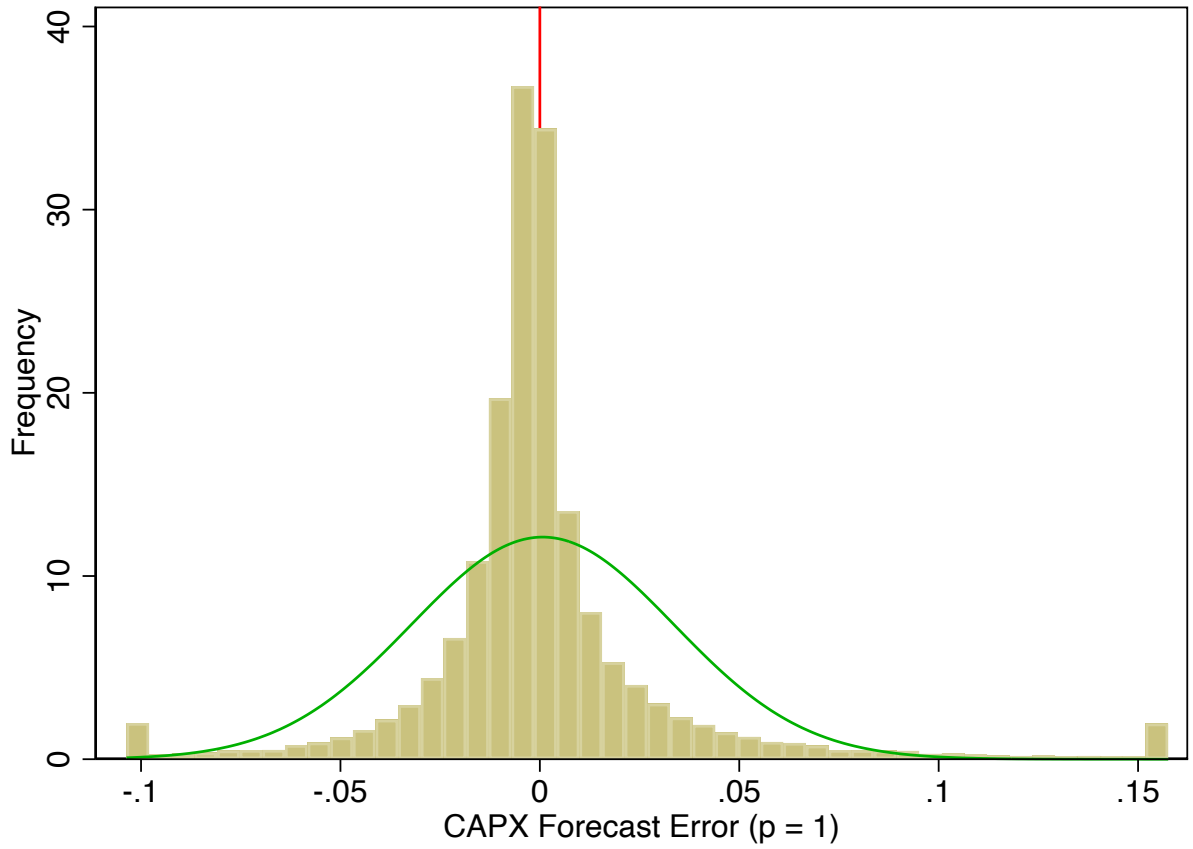
Source: The top image is from page 9 of the Jetblue 2013 Q4 Earnings presentation. The bottom image is from page 20 of Southern Company's 2023Q4 Earnings Call.

Figure C.3: Sources of Data



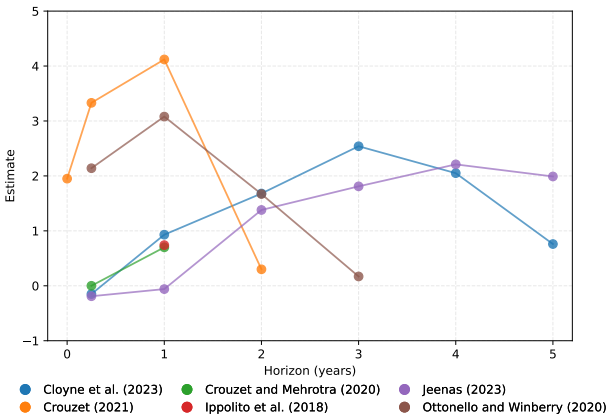
Note: This graph shows the number of data sources, aggregated quarterly, and sorted by source type. SEC filings refer to relevant forms and filings such as 10-K, etc. Earnings reports, annual and quarterly reports posted by the firm, and press releases are included in Earnings. Data collected from presentations for analyst meetings, shareholder or investor reports are included in Investor Reports.

Figure C.4: Histogram: 1-year Projection Period Investment Forecast Errors



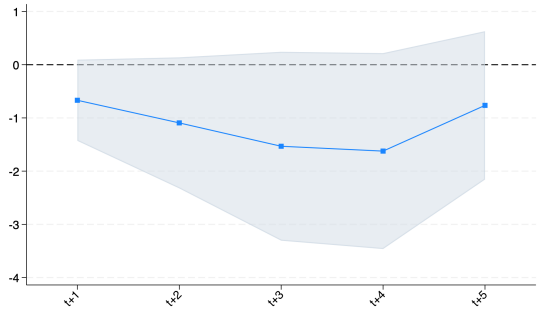
Notes: This figure plots the distribution of 1-year projection period capex forecast errors. Capex forecast errors in year t are computed as the difference between realized capex in fiscal year t and capex plans for year t announced at the beginning of that year, normalized by total assets. The sample is annual, covering the period from 1994 to 2025, and includes all available plans data. Forecast errors are winsorized at the 1st and 99th percentiles.

Figure C.5: Summary of Estimates of the Responsiveness of Capital Expenditures to Interest Rates

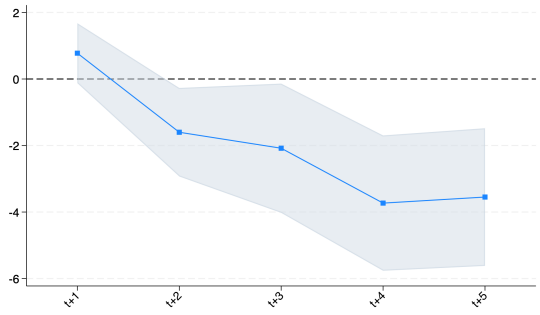


Notes: This figure plots existing estimates from the literature of the cumulative effect of a monetary policy shock on capital expenditures over different horizons. The figure is scaled to show the effect of a 1pp monetary policy shock on the change in capital stock, as a percentage of prior capital stock.

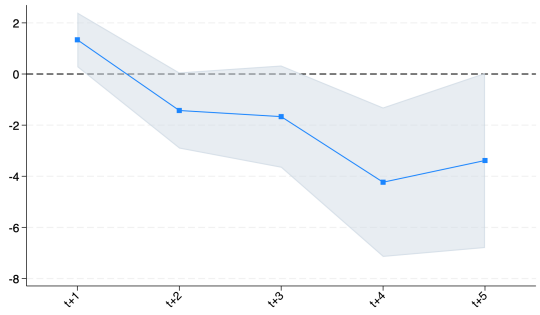
Figure C.6: Impact of Monetary Policy Shocks on Investment: $\tilde{\Delta}F_{i,t}[I_{i,t+1}]/A_{i,t-1}$



(a) Bauer-Swanson MPS



(b) Shock 2y



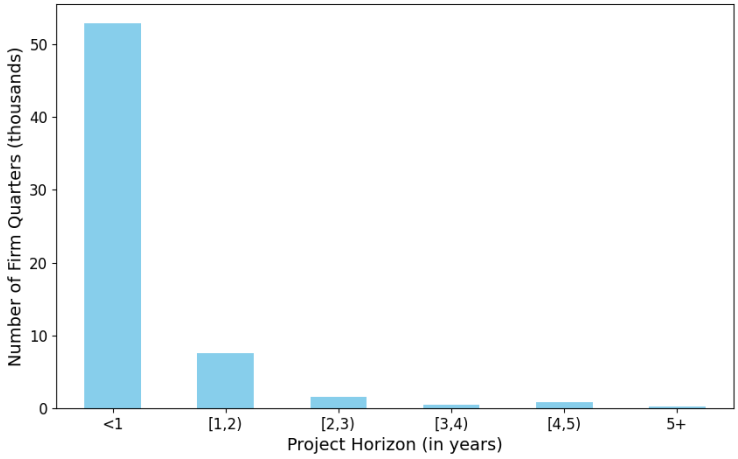
(c) Shock 10y

Notes: This figure depicts β_h^P for the following specification, for $h = 1,2,3,4,5$:

$$\tilde{\Delta}F_{i,t}[I_{i,t+1}]/A_{i,t-1} = \beta_h^P \,\text{MPS}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}, \tag{37}$$

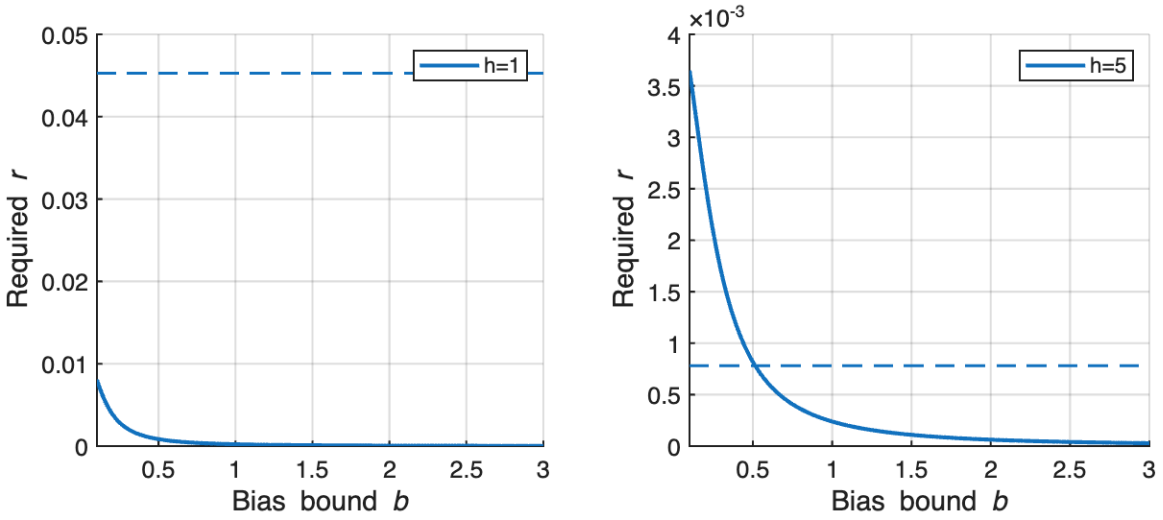
where h denotes the years from today that the plan is for. Here, $h = 1$ if the difference between the projection date and the end of the projection horizon is between 6-18 months, $h = 2$ if the difference is between 18-30 months, $h = 3$ if the difference is between 30-42 months, $h = 4$ if the difference is between 42-54 months, and $h = 5$ if the difference is between 54-70 months. Panel (a) uses the Bauer and Swanson [2023] shock, Panel (b) uses the high frequency change in the 2-year UST yield, and Panel (c) uses the high frequency change in the 10-year UST yield. The regression controls $X_{i,t-1}$ include firm-level characteristics (cash-to-assets, leverage, log assets, return on assets, tangibility, and Tobin's Q), the quarter change in the CFNAI index, the level of the CFNAI index, the 2-, 5-, and 10-year U.S. Treasury yields, all as of quarter $t-1$, as well as four lags of GDP growth, the inflation rate and the unemployment rate. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level. The shaded area represents 90% confidence intervals.

Figure C.7: Distribution of Project Horizon Across Firm Quarters



Notes: This figure shows the distribution of Project Horizon across firm quarters that have projections. Project Horizon is computed as the difference in months between the announcement of the projection and the end of the projection period, and rounded to the nearest year.

Figure C.8: Required r Across Bias Levels

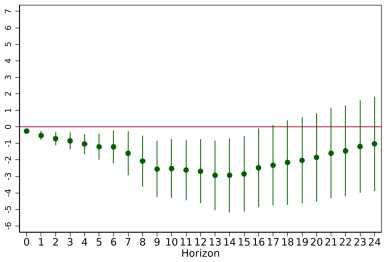


(a) Plan horizon: 1 Year

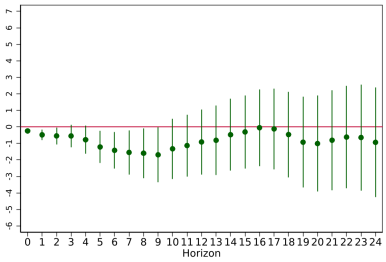
(b) Plan horizon: 5 Years

Notes: This figure plots the minimum $r = N_P/N_R$ required for plans data to have a lower MSE than realized investment data for each horizon h. The dotted line represents the actual ratio r in the data for that horizon.

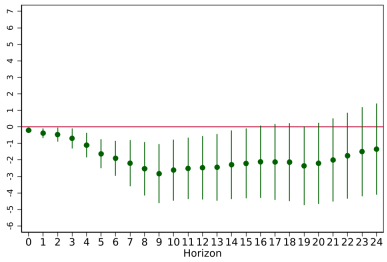
Figure C.9: Heterogeneity in Cumulative Real Net Issuance Response to 2Y UST Shock



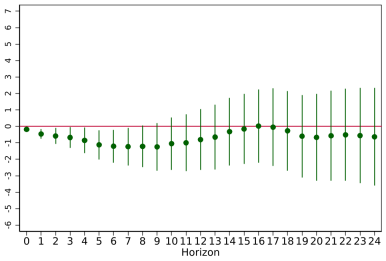
(a) Top 1/3, Asset



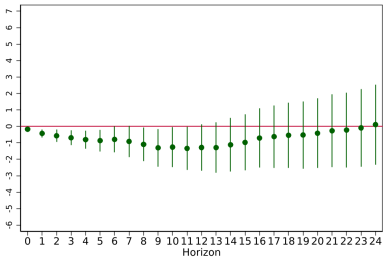
(b) Top 1/3, Leverage



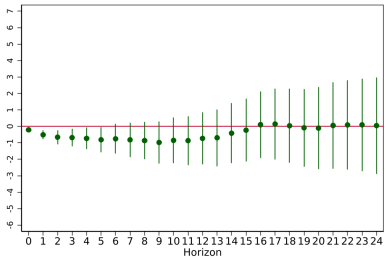
(c) Top 1/3, Tangibility



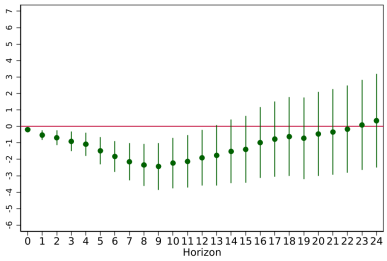
(d) Bottom 2/3, Asset



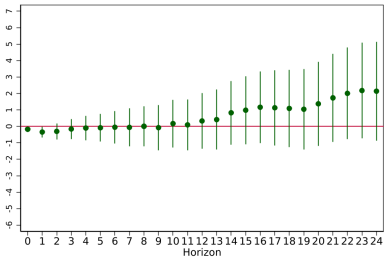
(e) Bottom 2/3, Leverage



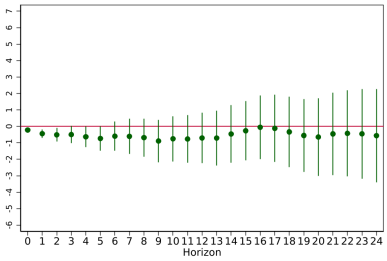
(f) Bottom 2/3, Tangibility



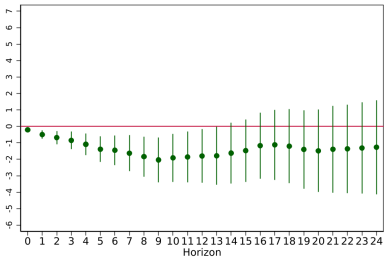
(g) Top 1/3, Int Exp/Debt



(h) Top 1/3, ROA



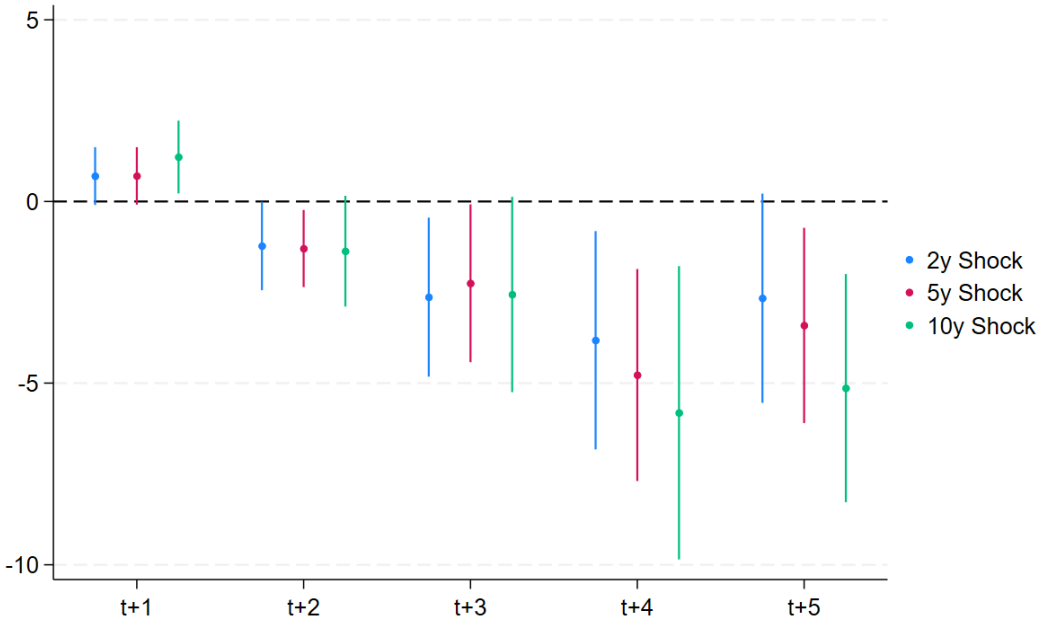
(i) Bottom 2/3, Int Exp/Debt



(j) Bottom 2/3, ROA

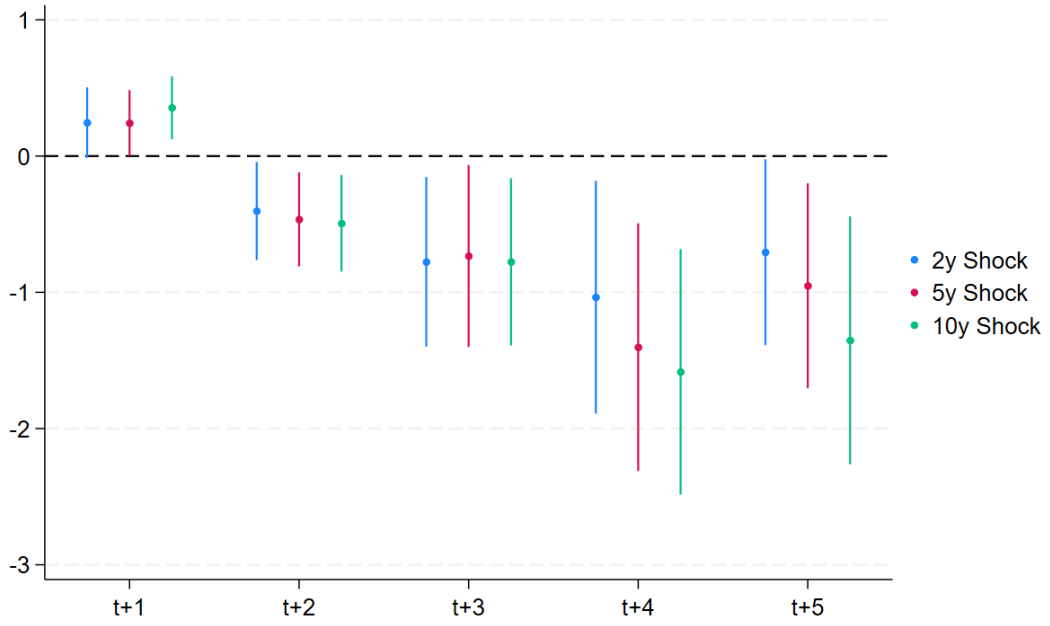
Note: The figure plots the coefficients and 95% confidence intervals from the regressions $\sum_0^h RealNetIss_{i,t+h}/Asset_{t-1} = \beta_h MPS_{t-1} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}$ with h running from 0 to 24. Firm fixed effects are included, and standard errors are clustered at the firm and month level. The cumulative real net issuance is normalized by the previous-quarter asset and winsorized at the 1st and 99th percentiles. MPS_t is the sum of the high-frequency change in the 10-year UST yield occurring in quarter t. The sample is monthly, covering the period from 2000 to 2024. Subsamples (top 1/3 or bottom 2/3) are used for the relevant characteristics variable. The firm characteristics are size (ln Assets), leverage (Total Debt/Assets), tangibility (PPE/Assets), interest expense to debt (Interest Expense/Total Debt), and profitability (NI/Assets). Standard errors are clustered by firm and month.

Figure C.10: Planned Investment Response to Monetary Policy by Horizon



Note: This figure plots the coefficients and 95% confidence intervals from the OLS regressions of planned capital expenditure growth on MPS over the prior fiscal quarter. We include dummy variables for investment plans extending 2, 3, 4, and 5 years ahead; the excluded category consists of plans for the subsequent fiscal year, conditional on the projected year ending at least three months after the plan announcement. The horizons are shown as $t+1$ to $t+5$ on the x-axis. Planned capital expenditure change is computed relative to the realized capital expenditure of four quarters ending one (two) fiscal quarter before the announcement, normalized for inflation and divided by the rolling sum of the real assets over the prior 4 quarters ($t-4$ to $t-1$). MPS refers to the high-frequency change in the 2-, 5-, and 10-year UST yield. The monetary-policy event window measures are constructed by summing 2-day shocks into a 90-day rolling window up to the quarter end prior to the announcement. The regressions also control for quarterly firm-level characteristics, including lagged size (ln(Assets)), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash-to-assets, and Tobin's Q. Macro controls include the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, as well as the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$. Four lags of GDP growth, the inflation rate, and the unemployment rate are also included. Firm fixed effects and projection horizon fixed effects are included, and standard errors are clustered at both the firm and time levels. The outcome variable is trimmed at the 2nd and 98th percentiles.

Figure C.11: IV: Planned Investment Response to Changes in Treasury Yields by Horizon



Note: This table reports IV regressions of real planned capital expenditure growth on changes in U.S. Treasury yields over the prior fiscal quarter, where yields are instrumented using high-frequency MP-driven shocks to a duration-matched U.S. Treasury future. We include dummy variables for investment plans extending 2, 3, 4, and 5 years ahead; the excluded category consists of plans for the subsequent fiscal year, conditional on the projected year ending at least three months after the plan announcement. The horizons are shown as $t+1$ to $t+5$ on the x-axis. Planned capital expenditure change is computed relative to the realized capital expenditure of four quarters ending one (two) fiscal quarter before the announcement, normalized for inflation and divided by the rolling sum of the real assets over the prior 4 quarters ($t-4$ to $t-1$). The regressions also control for quarterly firm-level characteristics, including lagged size (ln(Assets)), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash-to-assets, and Tobin's Q. Macro controls include the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, as well as the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$. Four lags of GDP growth, the inflation rate, and the unemployment rate are also included. Firm fixed effects and projection horizon fixed effects are included, and standard errors are clustered at both the firm and time levels. The outcome variable is trimmed at the 2nd and 98th percentiles.

Table C.1: Testing if Lagged Investment is a Reasonable Proxy for Prior Plan

	Correlation		Residual and MPS	Predictive Power for I_i,t+1		Selection	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Lagged capex plan	Lagged capex plan	Residuals	Future capex	Future capex	Future capex	Future capex
Lagged capex	0.909***	0.408***			0.946***	0.948***	0.344***
	(0.0107)	(0.0721)			(0.00850)	(0.00288)	(0.0192)
Lagged capex plan				0.820***			
				(0.0166)			
MPS			-0.0429				
			(0.274)				
Plan available=1 × Lagged capex						-0.00262	0.00157
						(0.00770)	(0.00378)
Plan available						0.0276	-0.00872
						(0.0448)	(0.0243)
Macro Controls		✓	✓				✓
Firm Controls		✓	✓				✓
Firm FE		✓	✓				✓
Observations	2310	1630	1630	2274	2246	24133	21466
R-squared	0.735	0.920	0.0000159	0.749	0.883	0.891	0.944

Notes:

Column (1), "Correlation," shows the raw correlation between lagged investment and the investment plan; Column (2), "Correlation," repeats (1) including firm fixed effects; Column (3), "Residual and MPS," regresses the plan-news residual on the MPS shock with controls. Includes only annual plans and realizations for investment in time periods ending in 9-13 months from announcement;. Column (4), "Predictive Power for $I_{i,t+1}$ (actual)," reports the coefficient from OLS of future investment on lagged investment plan; Column (5) repeats this regression using the lagged actual investment, conditional on there being a plan; Column (6), "Selection (OLS)," tests whether plan availability is correlated with lagged investment via an interaction term; Column (7), "Selection (FE&Controls)," repeats (6) adding firm and quarter fixed effects plus controls. Includes only annual plans and realizations for investment in time periods ending in 9-13 months from announcement.

Table C.2: Summary Statistics for Firm Characteristics by Data Source

	IBES				LSEG				MANUAL			
	Mean	25th pct	Median	75th pct	Mean	25th pct	Median	75th pct	Mean	25th pct	Median	75th pct
# of firms	3131				1357				881			
Projection periods	7.26	4.00	7.00	10.00	7.74	4.00	8.00	10.00	12.36	6.00	9.00	11.00
# quarters w/capex plans	20.55	9.00	17.00	29.00	32.30	20.00	33.00	44.00	42.90	25.00	39.00	59.00
Assets	5266.45	508.81	1385.08	3930.99	10557.42	1091.75	2802.15	8299.05	15844.13	1620.84	3799.32	11507.22
Return on equity	0.01	-0.01	0.02	0.04	0.04	0.01	0.03	0.05	0.03	0.01	0.03	0.05
Tobin's Q	3.50	1.16	1.94	3.40	3.51	1.44	2.27	3.65	3.44	1.28	1.98	3.48
Investment rate	-0.01	-0.02	-0.00	0.02	-0.00	-0.02	-0.00	0.02	-0.00	-0.01	0.00	0.02
Physical capital to assets	0.36	0.14	0.29	0.55	0.33	0.14	0.27	0.48	0.40	0.17	0.35	0.62
Z-score	2.82	0.78	1.78	3.36	3.69	1.53	2.54	4.17	2.91	1.02	1.85	3.28
Leverage	0.32	0.14	0.30	0.46	0.26	0.13	0.25	0.37	0.34	0.21	0.32	0.45
Cash/assets	0.12	0.02	0.07	0.17	0.11	0.02	0.07	0.16	0.09	0.02	0.05	0.12
Planned capex growth (%)	-0.49	-1.36	0.05	1.12	-0.08	-0.85	0.16	1.11	0.06	-0.89	0.15	1.24
Planned net income growth (%)	3.06	-0.39	0.49	1.91	3.36	-0.50	0.55	2.19	1.95	-0.57	0.33	1.74
Capex growth (%)	0.35	-1.11	0.14	1.59	0.52	-0.73	0.22	1.49	0.72	-0.51	0.22	1.56
Net income growth (%)	0.29	-3.67	0.44	4.25	1.09	-1.65	0.83	3.66	1.07	-1.54	0.65	3.23

Notes: This table reports characteristics of firms for three sources: firms listed in IBES, firms listed in LSEG, and firms listed in our manual plans table. Z-score is measured as Altman Z-score. Projection periods are presented in months. Nominal net income growth and nominal capex growth are calculated as the difference between planned and realized values, normalized by prior-period assets. Planned capex growth is defined as the planned real capex for firm i in future period h, relative to the rolling sum of real capex over the prior four quarters, divided by prior-period assets, and the same definition applies to planned net income growth. The full sample is quarterly with projection release dates spanning from 2000 Q1 to 2024 Q3. Within the sample, IBES data spans from 2002 Q4 to 2023 Q4, LSEG data covers 2004 Q1 to 2021 Q4, and our manually collected plans table covers the full range from 2000 Q1 to 2024 Q3. All measures are winsorized at 1% and 99%.

Table C.3: Within-Firm Variation in Characteristics and Timing of Inclusion

	Capex plans disclosed		Net income exp disclosed	
	(1)	(2)	(3)	(4)
Z-score	0.000564	0.000325	-0.000102	0.0000784
	(0.00119)	(0.00115)	(0.00118)	(0.00108)
Return on equity	-0.0369**	-0.0289	0.0700***	0.0658***
	(0.0175)	(0.0175)	(0.0150)	(0.0158)
Investment rate	-0.202***	-0.0900	0.176***	0.0781
	(0.0742)	(0.0743)	(0.0616)	(0.0541)
Tobin's Q	-0.00110	-0.00110	0.000458	0.000440
	(0.000803)	(0.000792)	(0.000776)	(0.000697)
Leverage	0.178***	0.0583**	-0.230***	-0.0755***
	(0.0288)	(0.0250)	(0.0371)	(0.0278)
Cash/Assets	-0.186***	-0.155***	-0.0181	-0.0447
	(0.0383)	(0.0363)	(0.0372)	(0.0347)
Constant	0.757***	0.787***	0.247***	0.208***
	(0.0113)	(0.00922)	(0.0137)	(0.0103)
Firm FE	✓	✓	✓	✓
Quarter FE		✓		✓
Observations	78979	78973	78979	78973
R-squared	0.429	0.442	0.444	0.476

Notes: This table reports firm-level panel regressions using a dataset at the firm-quarter level. The dependent variable is a binary indicator equal to 1 if the firm announces capex or net income plans in a given quarter, as recorded in our plans table. The Z-score refers to the Altman Z-score. The sample covers from 1994 Q1 to 2025 Q1 and includes the full panel of firm-quarter observations for all firms that appear at least once in IBES. Standard errors are clustered at both the firm and quarter levels. All independent variables are winsorized at the 1st and 99th percentiles.

Table C.4: Predictiveness of Investment Plans

	capex (log)				capex growth rate		capex/ Assets	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Planned capex (log)	0.893***	0.871***	0.456***	0.387***				
	(167.21)	(140.07)	(18.13)	(16.11)				
LT horizon=1 × Planned capex (log)				-0.0905***				
				(-7.46)				
Planned capex growth					0.799***	0.789***		
					(42.66)	(41.18)		
LT horizon=1 × Planned capex growth						-0.0913*		
						(-2.21)		
Planned capex growth / assets							0.589***	0.541***
							(19.22)	(16.15)
LT horizon=1 × Planned capex growth / assets								-0.167***
								(-4.67)
LT horizon				0.662***		0.184***		0.00924***
				(8.87)		(8.43)		(4.96)
Year FE	✓		✓	✓	✓	✓	✓	✓
Year x Industry FE		✓						
Firm FE			✓	✓	✓	✓	✓	✓
Observations	23369	23248	22745	28041	21166	25976	23316	28682
Rsquared	0.802	0.813	0.939	0.939	0.518	0.480	0.599	0.529

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: This table presents OLS estimates relating planned to realized capital expenditure outcomes. Columns labeled "capex (log)" report coefficients from regressions of log actual capital expenditure on log planned capex; columns labeled "capex growth rate" report coefficients from regressions of realized capital expenditure growth on planned capital expenditure growth; and columns labeled "capex / Assets" show the analogous results when both planned and realized growth are scaled by total assets. All regressions focus on the one-period projection horizon, except in the final column of each block, the sample is all plans and the planned regressor is interacted with an indicator for LT plans. We exclude observations with planned growth above 200 percent and winsorize realized growth at the 1st and 99th percentiles. We nclude firm and year fixed effects (with an additional year × industry fixed effect in the second column of each block), and cluster standard errors at the firm and quarter level.

Table C.5: Classification of Investment Plan Types

Category	**Keywords**
Acquisitions	Acquisitions, Redevelopment, Acquisition
Strategic	Strategic, Advancement, Priorities, Synergies, Separation, Open, Projects, Initiatives, Emerging, Restructuring
Maintenance	Maintenance, Maintain, Repair, Replacement, Renovations, Renovation, Existing, Upgrades, Ongoing, Reliability, Cost Reduction, Modernize, Operations, Routine
Physical Infrastructure	Property, Equipment, Manufacturing, Nuclear, Aircraft, PPE, Infrastructure, Operating Assets
Dirty Energy	Drilling, Oil, Coal, Refining, Mining
Expansion Growth	Expansion, Expand, Grow, Growth, New, Stores, Construction, Improvements, Expanding, Transformation, Improve, Enhancement, Enhancements, Enhance, Enhancing
Environmental	Environmental, Clean, Reduce, Emissions, Renewable, Solar, Wind
Research & Development	Research, Development, Product, Innovation, Innovative, Exploration, AI, Technology, Artificial, Machine Learning

Note: Lists the categories of investment plan types and the corresponding words within investment plans that map to each category.
Source: Manually collected data.

Table C.6: OLS: Response of Investment Plans to Changes in Treasury Yields

	LHS: $\tilde{\Delta} F_{i,t}[I_{i,t+h}]$/Assets			
	(1) RHS:$\Delta UST2y$	(2) RHS:$\Delta UST5y$	(3) RHS:$\Delta UST10y$	(4) RHS:$\Delta UST2-10y$
Δ UST	0.246***	0.176**	0.132	-0.287***
	(0.0646)	(0.0710)	(0.0800)	(0.107)
Over 1yr plan×Δ UST	-0.181	-0.260**	-0.278**	-0.159
	(0.135)	(0.124)	(0.121)	(0.172)
Firm Controls	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	65985	65985	65985	65985
R-squared	0.274	0.273	0.273	0.274

Note: This table reports OLS regressions of real planned capital expenditure growth on changes in U.S. Treasury yields over the prior fiscal quarter. We include dummy variables for investment plans that extend 12 or more months ahead; the excluded category consists of plans for the subsequent fiscal year, conditional on the projected year ending at least three months after the plan announcement. Planned capital expenditure growth is computed relative to the realized capital expenditure of four quarters ending one (two) fiscal quarter before the announcement, normalized for inflation. The regressions also control for quarterly firm-level characteristics, including lagged size (ln(Assets)), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash-to-assets, and Tobin's Q. Macro controls include the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, as well as the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$, both measured on the day of the announcement. Four lags of GDP growth, the inflation rate, and the unemployment rate are also included. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.

Table C.7: First Stage: Changes in Treasury Yields on Monetary Policy Shocks

	(1) $\Delta UST2y_t$	(2) $\Delta UST5y_t$	(3) $\Delta UST10y_t$	(4) $\Delta UST2-10y_t$	(5) $\Delta UST2y_t$
Shock 2y	2.091***				
	(0.432)				
Shock 5y		1.735***			
		(0.453)			
Shock 10y			2.028***		
			(0.550)		
Shock 2-10y				1.797***	
				(0.420)	
Pure MPS					-0.0923
					(0.522)
Constant	0.245*	0.351**	0.354**	0.120	0.0406
	(0.131)	(0.159)	(0.156)	(0.0959)	(0.145)
Macro Controls	Yes	Yes	Yes	Yes	Yes
Observations	313	313	313	313	313
R-squared	0.207	0.142	0.153	0.274	0.111

Note: This table reports the first-stage results from IV regressions of planned capital expenditure growth on changes in U.S. Treasury yields over the prior fiscal quarter. In the first stage, we instrument the changes in yields using high-frequency monetary policy-driven shocks to a duration-matched U.S. Treasury future. Macro controls include the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, as well as the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$, both measured on the day of the announcement. Four lags of GDP growth, the inflation rate, and the unemployment rate are also included.

Table C.8: IV: Response of Investment Plans to Changes in Treasury Yields

	LHS: $\tilde{\Delta} F_{i,t}[I_{i,t+h}]$/Assets			
	(1) IV RHS: $\Delta UST2y$	(2) IV RHS: $\Delta UST5y$	(3) IV RHS: $\Delta UST10y$	(4) IV RHS: $\Delta UST2-10y$
Δ UST	0.293*	0.301**	0.411***	0.486
	(0.156)	(0.142)	(0.136)	(0.569)
Over 1yr plan×Δ UST	-0.682**	-0.883***	-0.990***	-0.477
	(0.308)	(0.276)	(0.269)	(0.894)
Firm Controls	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	65985	65985	65985	65985
R-squared	0.0723	0.0712	0.0701	0.0682

Note: This table reports IV regressions of real planned capital expenditure growth on changes in U.S. Treasury yields over the prior fiscal quarter, where yields are instrumented using high-frequency MP-driven shocks to a duration-matched U.S. Treasury future. We include dummy variables for investment plans that extend 12 or more months ahead; the excluded category consists of plans for the subsequent fiscal year, conditional on the projected year ending at least three months after the plan announcement. Planned capital expenditure growth is computed relative to the realized capital expenditure of four quarters ending one (two) fiscal quarter before the announcement, normalized for inflation. The regressions also control for quarterly firm-level characteristics, including lagged size (ln(Assets)), leverage (Total Debt/Assets), return on assets (NI/Assets), tangibility (PPE/Assets), cash-to-assets, and Tobin's Q. Macro controls include the prior-quarter change in the CFNAI index, the prior-quarter level of the CFNAI index, as well as the two-year yield level $2y_{t-1}$ and the yield curve slope $10-2y_{t-1}$, both measured on the day of the announcement. Four lags of GDP growth, the inflation rate, and the unemployment rate are also included. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.